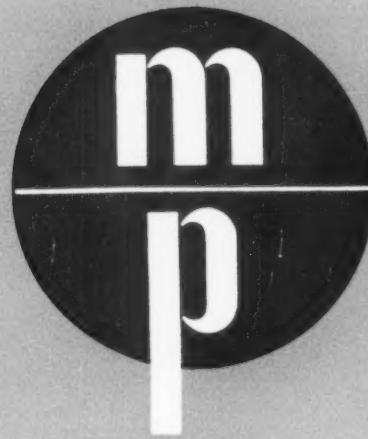


# MODERN PLASTICS



MAY 1950

# It pays to use your custom molder's know-how

when you want precision-fitting parts

## No. 17 in a series on Plastics Skill at Work...

**PROJECT:**  
One-piece case for adding  
machine

**CUSTOMER:**  
L. C. Smith & Corona  
Typewriter Inc.  
Syracuse, N. Y.

**MOLDER:**  
Northern Industrial  
Chemical Co.  
South Boston, Mass.

**MATERIAL:**  
Medium impact  
Durez phenolic plastic

**MOLDED-IN** ribs add to  
rigidity of long side panels,  
are undercut to permit ready  
attachment and detachment  
of the case. Case is delivered  
from the molder with under-  
cuts cut in and completely  
checked for tolerances.



**OFFICE MACHINE SERVICE CONDITIONS**  
emphasize non-resonance. The marked  
sound-deadening effect of the phenolic  
case helps to reduce noise at the source.



**CORNER HOLES**  
are molded in and fit  
over four locating  
pins on the machine.  
Good molding tech-  
nique assures accu-  
rate position of holes  
and rib undercuts.

If you are interested in reducing the expense involved in a multiplicity of tools and jigs, then this L C Smith & Corona adding machine housing of Durez plastics may suggest a profitable line of procedure.

Although it is molded in one-piece, it is so well designed and produced that it meets the rigid tolerances involved in work of this nature. The only machining is a simple undercut at the

sides, which is done by the molder.

Cooperating with Smith-Corona executives, Northern Industrial Chemical Co. plastics men shared in working out thick and thin wall sections, allowances for cooling and shrinking action, and various details that contribute to rapid assembly.

Here, as in jobs that you may undertake, the custom molder came into the picture with a thorough knowledge of

Durez phenolic plastics. The most versatile of all plastics, phenolics have flow and strength properties that permit great latitude of design. Eight distinct classes of Durez phenolics permit your engineers to select the mechanical, electrical, and chemical characteristics that suit their specific needs.

Durez technicians will be glad to work with you and your molders. Please feel free to call on them anytime.

A hit with plastics users everywhere is the handy "Durez Check-Chart." Write for yours. Durez Plastics & Chemicals, Inc., 125 Watch Rd., N. Tonawanda, N. Y.



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INDUSTRIAL RESINS  
PROTECTIVE COATING RESINS

PHENOLIC PLASTICS THAT FIT THE JOB



When you're tooled-up for  
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you're tuned-up for sales!

Its price?... pleasantly low! Its yield?... pleasingly high! *Catalin Styrene* possesses superior molding qualities. It flows rhythmically thru the most intricate cavities—faithfully holds the most difficult notes of design. It handles more advantageously than metal or wood—requires less labor and least assembling!

Sounding off for **MATTEL CREATIONS** of Culver City, Calif., and passing in review for you here are four of the many "Futurland Music Box Toys", processed of *Catalin Styrene* by the company's custom-molder, **PEERLESS PLASTICS** (also of Culver City). Each pays tribute to the sales crescendo that results when the right material, a competent molder and a creative manufacturer get together.

**CATALIN CORPORATION OF AMERICA**  
ONE PARK AVENUE, NEW YORK 16, N. Y.





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News of the Industry; Predictions and Interpretations; Company News; Personal; Meetings

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For further information and technical bulletins, please write Department GA-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco.



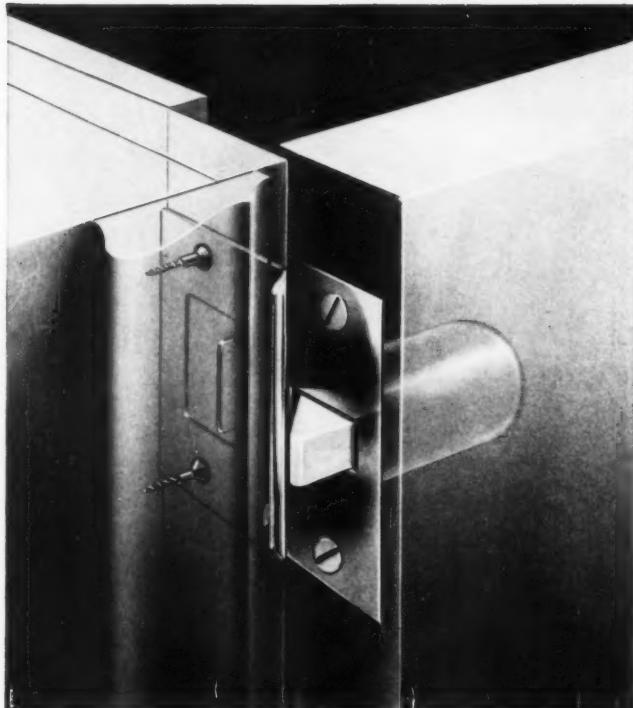
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\* \* \* \*

Experience has shown that molded nylon is ideal for a host of mechanical parts such as gears, bearings, bobbins, washers, pawls, grommets, cams, and similar units. It is exceptionally tough and resistant to abrasion. Its tendency to dampen vibration insures quiet operation. It

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neers. Just write or phone . . . today. There's no obligation.

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# EDITORIAL

## New Emphasis on Industrial Resins

HERE is an old saying in statecraft that "The times provide the man." It is similarly true that "The times provide the materials." The needs of these times have occasioned the recent intensified interest in industrial resins. The chief need is means of eliminating waste of materials or man-hours or money.

Between 66 and 72% of all trees cut down is wasted. Present waste of lumber amounts to more than 100 million tons a year, which is the main reason behind present interest in resins for bonding wood waste into structural boards and molded pieces. This wood-waste operation should consume upwards of 3 million lb. of phenolic and urea resins a month within five years.

Waste in man-hours, waste in rejects, and waste in processing material are the reasons behind the development of new foundry casting resins. These materials, used in bonding sand cores, permit the foundry industry to make precision castings requiring little or no finishing. One new process involving a new resin, shortly to be announced, provides a saving of up to 90% of sand and makes possible a greatly increased production of castings per man per day.

The estimated annual direct loss to the United States by corrosion is over five and a half billion dollars. It is no wonder that improved protective coatings based on plastic resins are of intense interest today. They are literally legion in number and their production involves the use of a wide variety of resins.

In the paint field, the need for better and faster curing coatings, coatings requiring less surface preparation,

coatings that may be applied with greater speed, has led to the recent development of more new resins for paints. The styrene emulsions, for example, give promise of revolutionizing the cold-water-mix paint industry.

Resins for coating metals in the container field are increasing in number and variety and utility. Of all beer packages, 20% or about 4 billion cans per year are now coated on the interior with vinyl; between one-fifth and one-fourth of all printing ink sold is in plastic coated metal containers. Now comes a new resin for the interior coating of collapsible metal tubes, the bond of the coating being so resistant to cracking that the food field can be opened up to this type of container.

For paper coating, the same need of the times is providing new industrial resins. Papers coated with polyethylene and vinyls are already affecting packaging.

Intensification of application work on ion exchange resins is linked to the same need of our times: the elimination of waste of men, money, and materials.

Behind the newer work on adhesives lie again the same reasons. Bonding at low pressures and low temperatures, bonding of metal to metal, metal to glass, and either to plastic, bonding for durability and resistance to physical and chemical attack has improved radically even in the past few months because of the new resins and new techniques available.

We are swiftly moving into a new industrial economy, wherein the elimination of waste of all kinds will be the prime need of industry. The times are providing the industrial resins to help industry meet that need.

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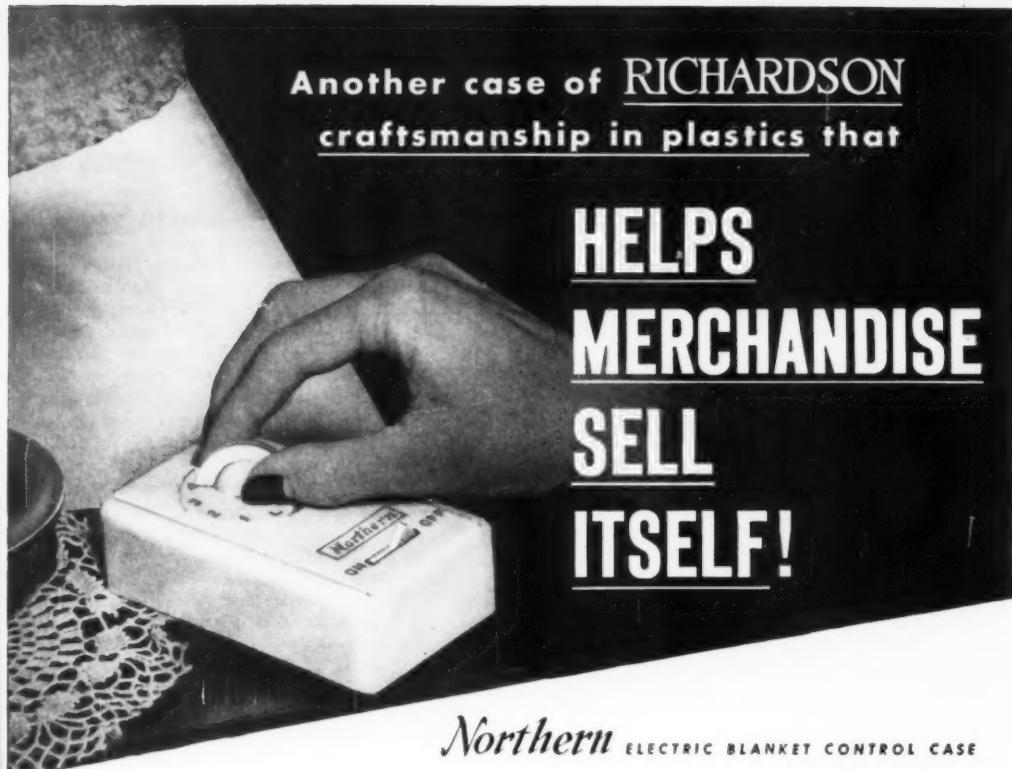
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Underside view of blanket control case. Mounts for control mechanism accurately positioned. Underside view of control knob also illustrated.

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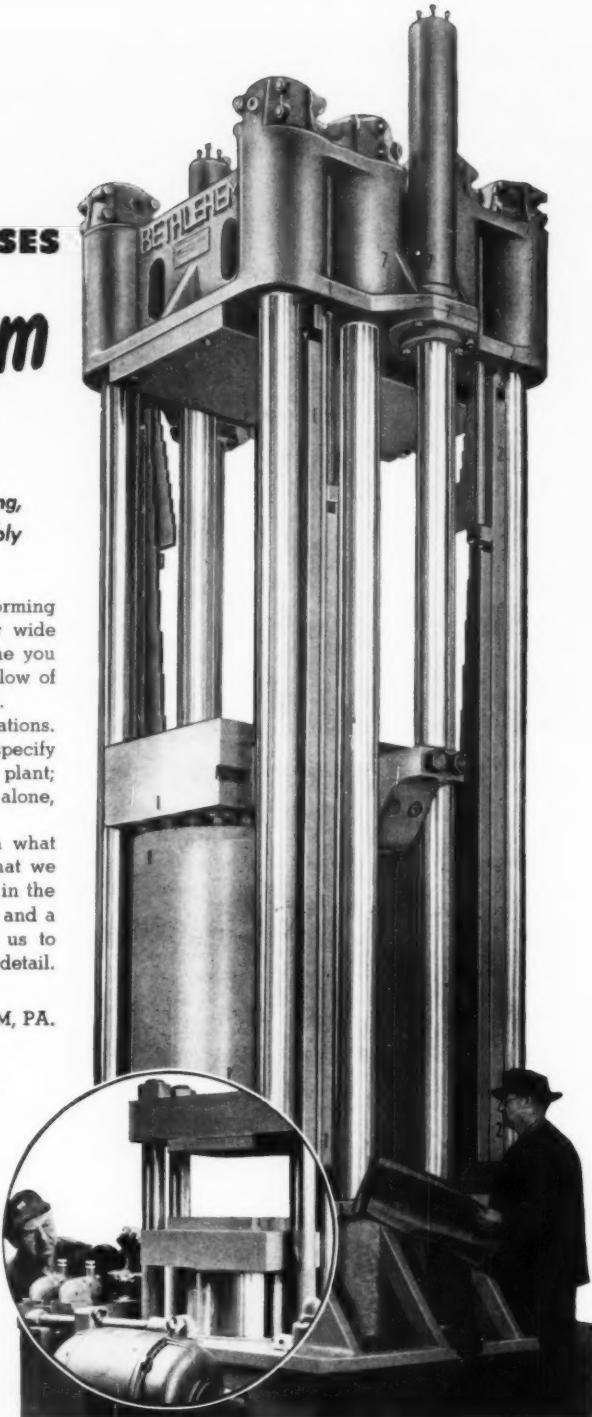
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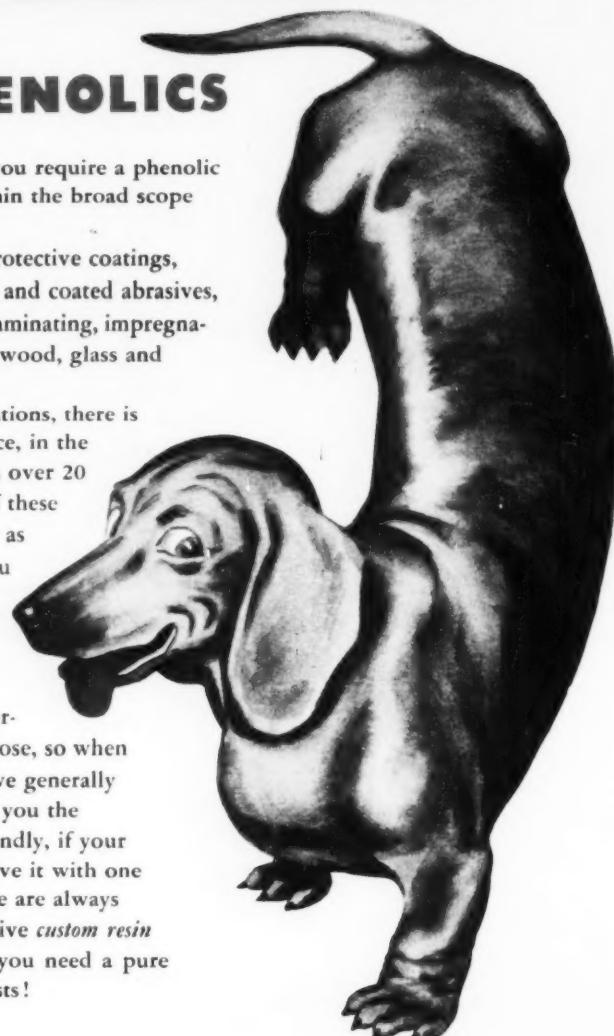
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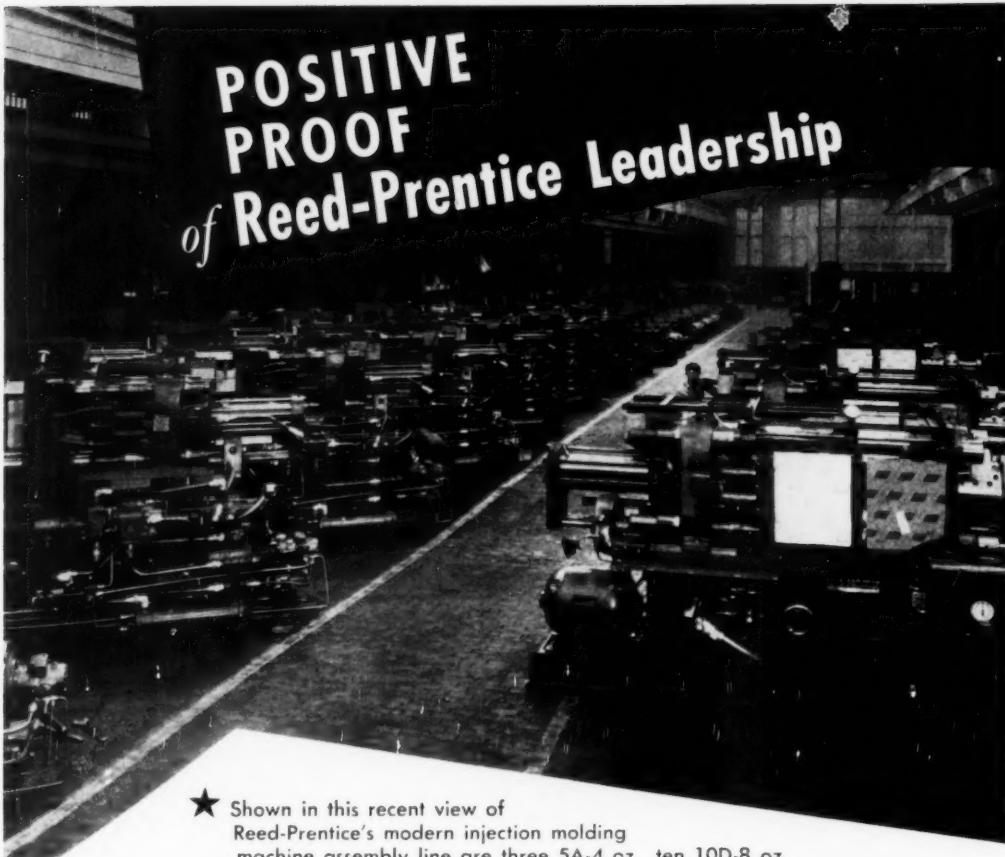
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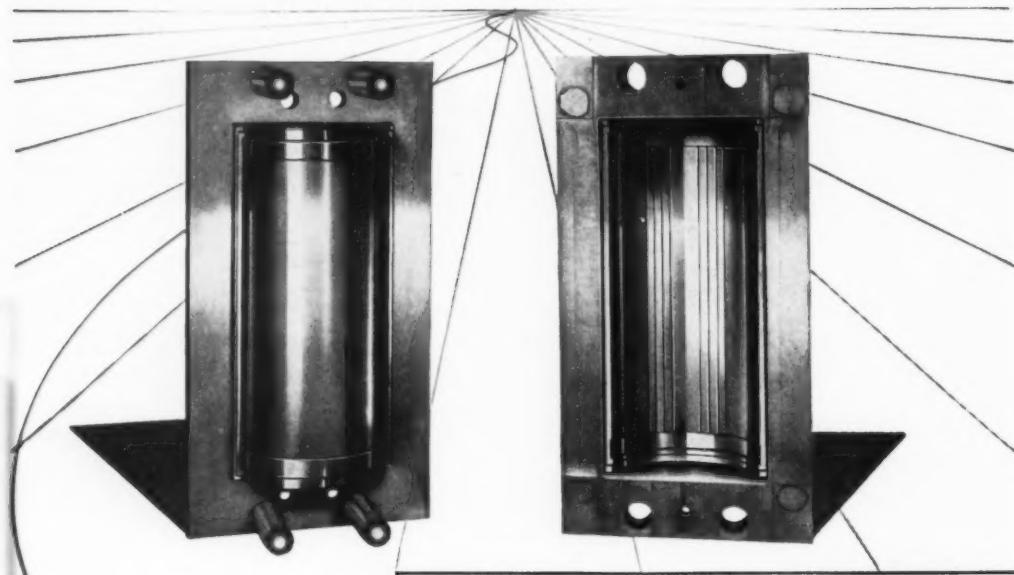
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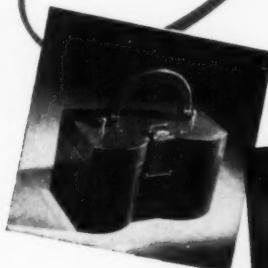
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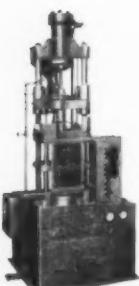
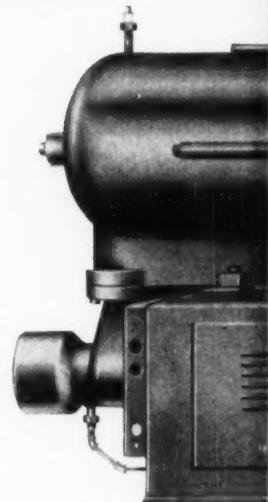
... and, all are obtainable from one source of supply—Watson-Stillman.

Since the very inception of the industry over 50 years ago, Watson-Stillman engineering ingenuity has paced the industry, year after year, with outstanding plastics molding machinery advancements.

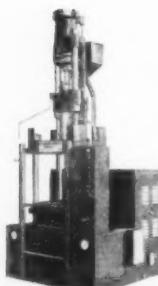
Today, from the W-S "COMPLETELINe" of Injection, Transfer and Compression Molding Machines, you can select a model to fit every production requirement—large and small.

And, W-S offers many additional services. Mold designs, material selection, operation, maintenance, plant layout, are all subjects about which W-S is in a particularly good position to give advice to its clients as a part of its "COMPLETELINe" service.

When planning plant extension or a new business, consult W-S first about plastics machinery and how to use it.



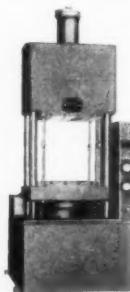
2 Ounce Semi-Automatic Injection  
Molding Machines



Vertical Injection Molding  
Machines—1, 2, and 4 ounces.



Preform Tabletting Machines  
—10 and 100 Tons



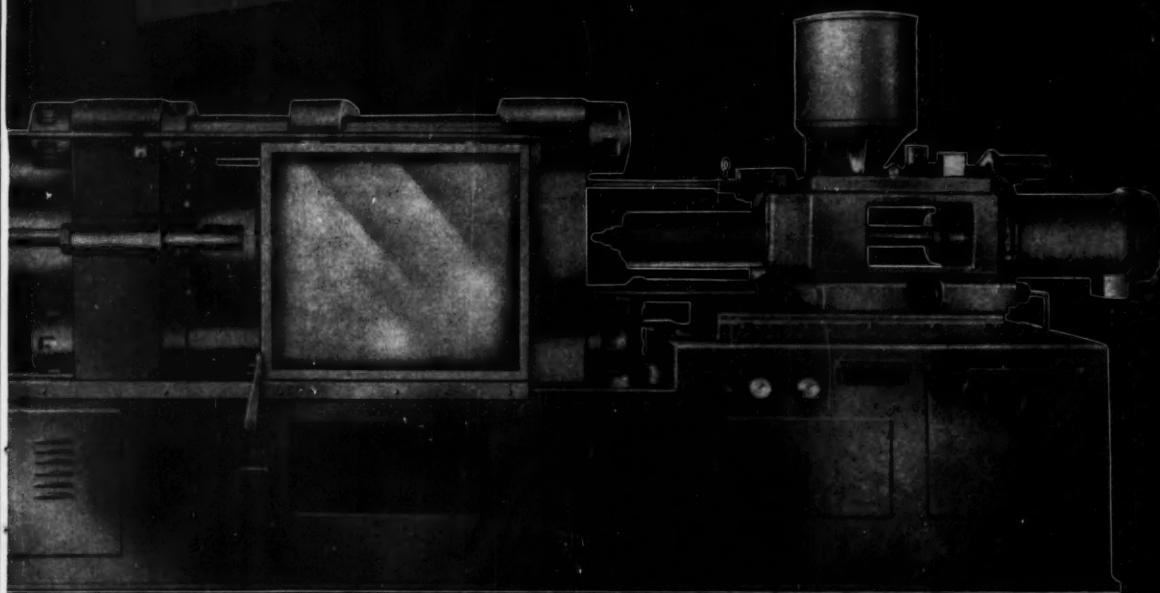
Transfer Molding Machines  
—30 to 1200 Tons



Compression Molding Presses  
—50 to 1200 Tons

**MANUFACTURERS OF THE MOST COMPLETE LINE OF HYDRAULIC MACHINERY**

# 2000 OZ.



Horizontal Injection Molding  
Machines—8 to 120 Ounces

## WATSON-STILLMAN



HYDRAULIC MACHINERY DIVISION Established 1848—Factory and Main Office, Roselle, New Jersey  
Branch Office: Chicago, Ill.

Manufactured in Canada by—Canadian Vickers, Ltd., Montreal

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Birmingham 3, Ala. George M. Meriwether  
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Watson-Stillman Co.

San Francisco 7, Calif. Schellenbach Mach. Tool Co.

St. Paul 4, Minn. Anderson Machine Tool Co.

Seattle, Wash. Machinery & Tool Supply Co.

Spokane 8, Wash. Machinery & Tool Supply Co.

Foreign Sales Representatives: OMNI PRODUCTS CORP., 460 Fourth Ave., New York 16, N. Y.

Correspondents Throughout the World



The Tupperware 50 oz. Canister is "standard equipped" with the Tupper Seal, air and liquid-tight flexible Pour All cover.

The Tupper Seal, air and liquid-tight flexible Pour All cover is used on every Tupperware 20 oz. Canister.

The Tupper Seal, air and liquid-tight Pour All cover as a cover for 46 oz. cans, upperware Sauce Dishes and other containers of metal, glass or pottery. Foods easily dispensable without removing entire cover.



The Tupperware Wonder Bowls are usually fitted with Tupper Seal, air and liquid-tight covers.



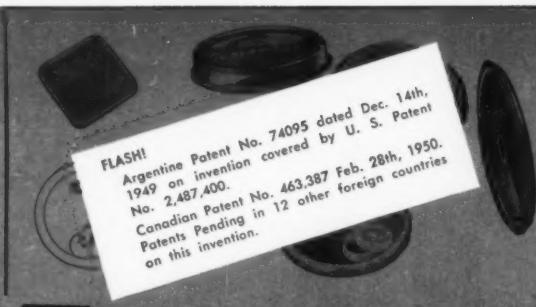
FACTORIES: Farmington, Mass., and Cuero, Texas

Manufacturers of — CONSUMER, INDUSTRIAL, PACKAGING AND SCIENTIFIC PRODUCTS

ADDRESS ALL COMMUNICATIONS TO: Department D

New York Show Room 225 Fifth Avenue

©1949 Tupper Corporation, Inc.



### FLASH!

Argentine Patent No. 74095 dated Dec. 14th, 1949 on invention covered by U. S. Patent No. 2,487,400.  
Canadian Patent No. 463,387 Feb. 28th, 1950.  
Patents Pending in 12 other foreign countries on this invention.

## TUPPER / Seals

air and liquid-tight, flexible covers for Tupperware Tumblers, Canisters, Wonder Bowls, Cereal Bowls and many another container of glass, metal and pottery, the contents of which it is desired to keep fresh and wholesome.

## TUPPER /

### FORMAL NOTICE!

9th November, 1949

### EXCLUSIVE!

U. S. Patent #2,487,400

The Tupper Corporation has attained a position of leadership in this industry by incurring great expense and expending painstaking effort in the development, design, manufacture and exploitation of its many world-known products.

The Tupper Corporation further has anticipated the inevitable attacks to which leadership is subject and has taken measures provided by law to preserve the creative rights to its products, methods and design by patent protection both in the United States and abroad.

Tupper Seals for Tupperware shown in this advertisement are just a few of the forms covered in this manner and are specifically covered by U.S. Patent #2,487,400.

Only the Tupper Corporation, by U.S. Patent #2,487,400 has the right to make, use and vend container closures in connection with any and all types of containers throughout the United States and its territories as covered by the claims of the Patent.

Tupper Corporation will protect, according to law, the exclusive rights above granted

TUPPER CORPORATION

## TUPPER CORPORATION

There's a Tupper Seal, air and liquid-tight flexible cover for Tupperware 5, 8 and 12½ oz. Tumblers too, and these Tupper Seal, covers for many other containers of metal, glass and crockery.

The Tupper Seal, air and liquid-tight flexible Pour Top cover, specially designed as a dispensing cover for specified containers holding foods such as syrup, salad dressings, catsup,



The cover of the Tupperware Bread Server which serves as a bread tray, also is designed to give similar results as Tupper Seal, air and liquid-tight flexible covers. Keep contents fresh as no other such container.



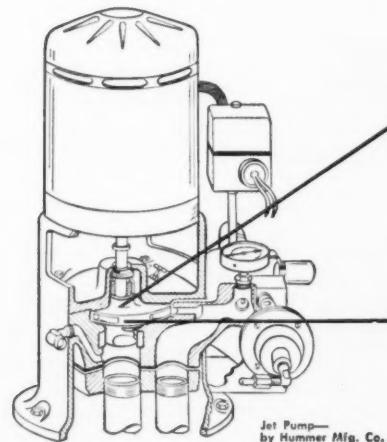
When equipped with Tupper Seal, air and liquid-tight, flexible covers, Tupperware Cereal Bowls serve many another purpose.



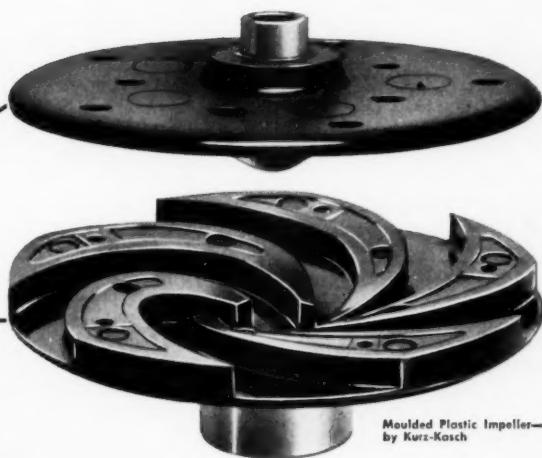
The Tupper Seal, air and liquid-tight flexible cover made for Tupperware 8 oz. Tumblers also fits and is sold with all Tupperware Funnel as a base when funnels are used as storage containers.

# PERFECT PERFORMANCE FOR PUMPS

**Here's a proven impeller in PLASTICS!**



Jet Pump—  
by Hummer Mig. Co.



Moulded Plastic Impeller—  
by Kurz-Kasch

## Kurz-Kasch

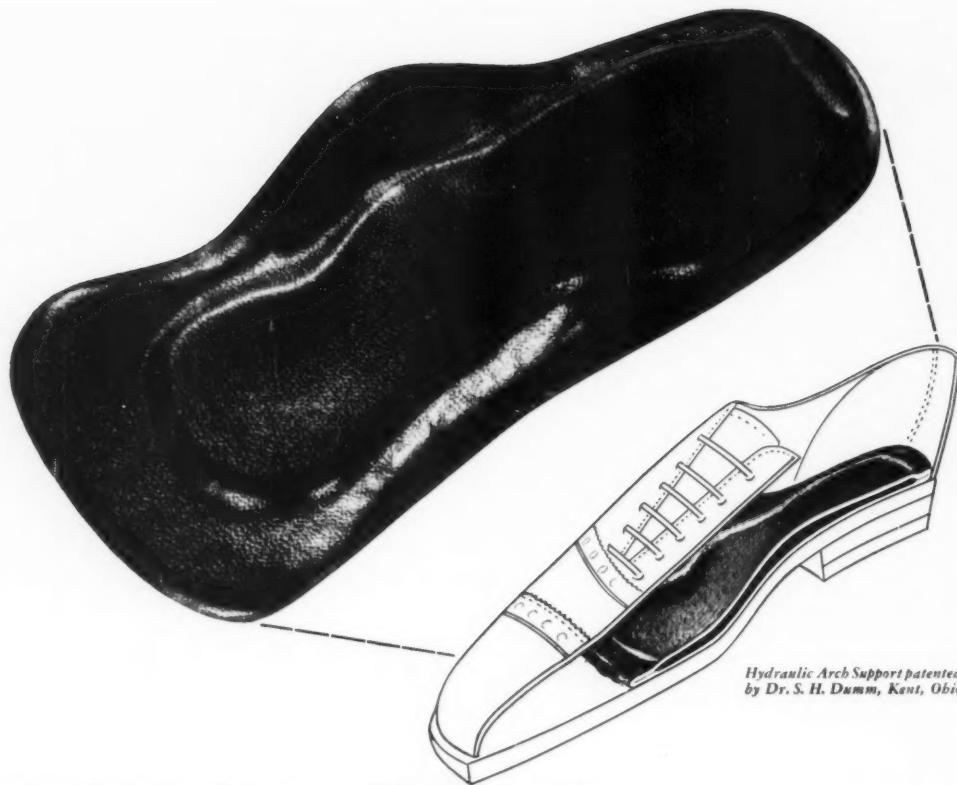
FOR OVER 34 YEARS PLANNERS AND MOULDERS IN PLASTICS

**Kurz-Kasch, Inc. • 1415 South Broadway • Dayton 1, Ohio**



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EXPORT OFFICE: 89 Broad Street, New York City,  
Bowling Green 9-7751.



## Neat trick for flat feet

### AMERICAN ANODE PLAYS A PART IN NEW HYDRAULIC ARCH SUPPORT

YOU never saw this kind of arch supporter before. It gives protective support to feet with a tendency to flatness, and where the arch is flat it does a corrective job.

The unique trick is done, not by a rigid support, but by helpful hydraulic action. The support consists of two layers of synthetic material enclosing a bag of hydraulic fluid. The fluid is mobile and builds up at the point of the arch that needs support.

This bag is another example of the almost endless variety of ways the American Anode process is used to develop or improve products profitably.

The process is a method whereby latices and mixes are deposited and converted to solid materials on a wide

variety of forms. It is used successfully in the textile, paper, toy manufacturing, medical and electro-plating fields.

We can do a complete production job for you. We have the equipment, trained personnel, latices and mixes. Or, you can license the process easily—even have us set it up in your plant, supply materials, technical advice and machinery.

American Anode mixes can be compounded in a broad range of colors. They can be sprayed, spread, saturated, dipped or brushed—and compounded to meet a wide variety of service conditions.

For complete information, technical advice, please write Department AC-3, American Anode Inc., 60 Cherry Street, Akron, Ohio.

# AMERICAN ANODE

CRUDE AND AMERICAN RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS, AMERAN RESIN PASTES

*Cumberland Announces*  
 A NEW, TROUBLE-FREE  
**PELLETIZING MACHINE**  
 FOR USE WITH  
 CONTINUOUS EXTRUDERS

**NOW COMPOUND YOUR OWN PLASTIC  
 MATERIAL MORE ECONOMICALLY THAN EVER**

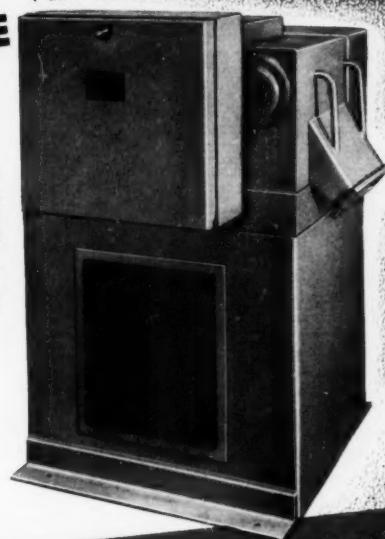
Many improved design features enable this new Cumberland Pelletizer to give amazingly efficient and trouble-free performance—24 hours a day.

**COMPANION MODEL TO ROTARY CHOPPER**

This newest Pelletizing Machine is the product of Cumberland's years of experience with the Rotary Chopping Machine—widely accepted for its superior on-the-job performance as a large-capacity pelletizer and for many other applications.

**SMALLER IN SIZE, LOWER IN COST**

Designed specifically for use with continuous extruders, the new Cumberland Pelletizer is smaller, more compact, and costs less than previous pelletizing machines.



**NEW, IMPROVED FEATURES**

Produces a superior molding material of uniform pellets.  
 Feed Rolls are pivoted to allow for easy cleaning.  
 Both Feed Rolls are driven by improved drive mechanism.  
 Cutting Chamber Enclosure is quickly removable.

*For more information, request bulletin 500.*

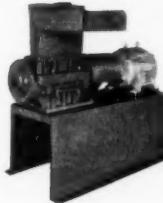
**CUMBERLAND**



**ROTARY  
 CHOPPING  
 MACHINE**

Heavy duty, rugged machine. Used for cutting thick vinylite slabs from two roll mills. Also used as large capacity pelletizer. Other applications are described in Bulletin 400.

**CUMBERLAND**



**GRANULATING  
 MACHINE  
 MODEL 18**

Large capacity. Double hung construction. Easy to inspect, dismantle, and adjust. Further details are in Bulletin 250.

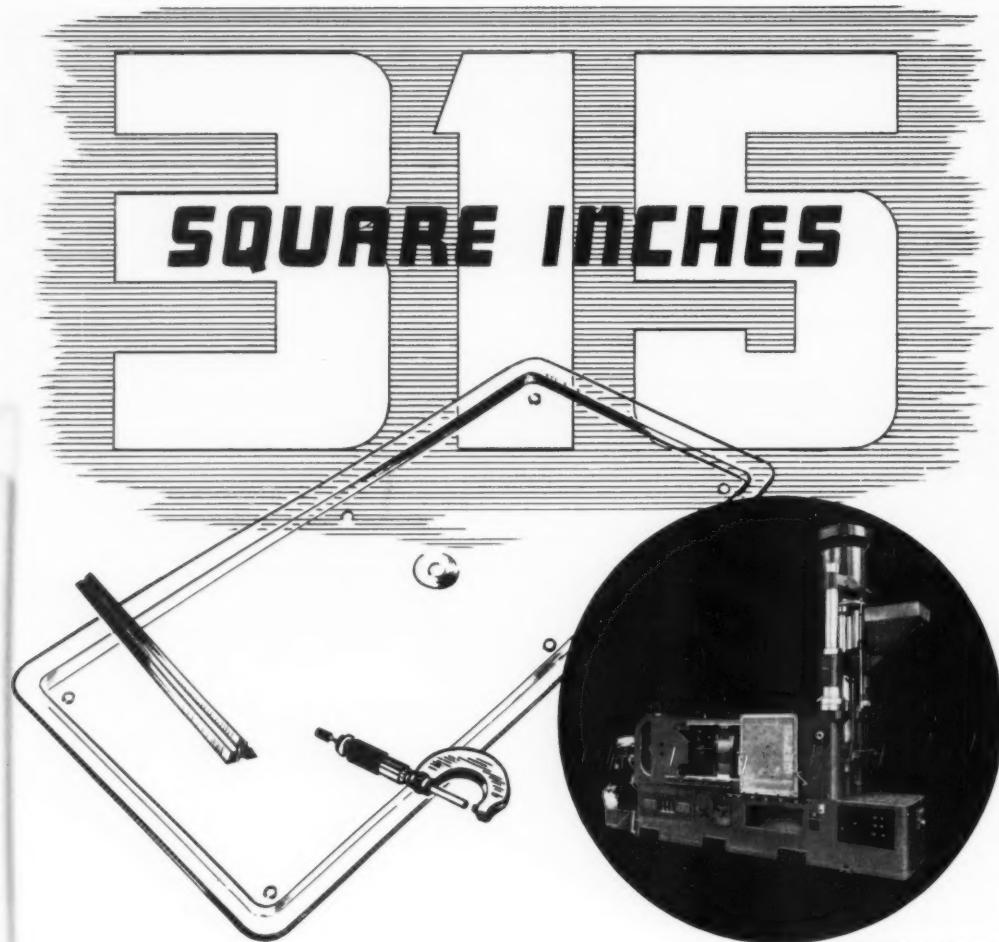
**CUMBERLAND**



**GRANULATING  
 MACHINES  
 MODELS 0, 1/2, 1 1/2**

Small and medium capacity. Designed specifically for plastics. Rugged and easy to clean. Request Bulletin 250.





Write for free copy  
of Lester Press

When one of the pioneers in molding technique puts a job on a machine built by the pioneers of injection molding machine design . . . the results are bound to be out of the ordinary.

You can see one of those jobs here . . . an exceptionally large crystal tray molded by the Bolta Company of Lawrence, Mass., on one of their 24 ounce Lesters (rated in polystyrene). The part is made for the Kelvinator Corporation to go in the deep-freeze compartment of their refrigerators.

This center gated part covers a projected area of 315 square inches . . . and over 365 square inches of mold area! It weighs 24 ounces in finished form and is produced at a rate of between 800 and 1200 shots per day. You, too, can look forward to molding faster, better, cheaper when you install a Lester . . . the machine with all the features!



## ESTER INJECTION MOLDING MACHINES

distributed by LESTER-PHOENIX, INC., 2621 CHURCH AVENUE • CLEVELAND 13, OHIO

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## For higher-quality Vinyl Films with easier processing

use

**PLIOVIC**  
A

*TEST with pyrometer shows that Pliovic A films can be calendered at lower temperatures than equivalent vinyl chloride copolymers.*

**Y**OU get easier processing of vinyls when you compound with **Pliovic A**. Here's why:

**Pliovic A** requires from 5% to 8% less plasticizer than equivalent copolymers of vinyl chloride, because of the more efficient internal plasticization of its second monomer.

**Pliovic A** calenders at temperatures 15° to 20° lower because it is more thermoplastic than similar-content

vinyl resins. Milling and extruding are also possible at equivalently lower temperatures.

**Pliovic A** films and coatings heat seal at temperatures as low as 250°F—a distinct advantage in the fabrication of many items.

In addition to these processing advantages, films made with **Pliovic A** are tough and durable—and possess excellent "hand" and "drape" as

well. They have high strength, good heat stability, light stability, high resistance to flex-fatigue and excellent chemical resistance.

For full details on **Pliovic A**—and **Pliovic AO** for organosols—write:

**Goodyear, Chemical Division**  
**Akron 16, Ohio**

**USE PROVED  
Products**

*We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network*

# GOOD YEAR

Pliovic—T.M. The Goodyear Tire & Rubber Company

# PLASTICS MACHINERY BULLETIN

Reporting News and Machine Design Developments

IN BUSINESS TO

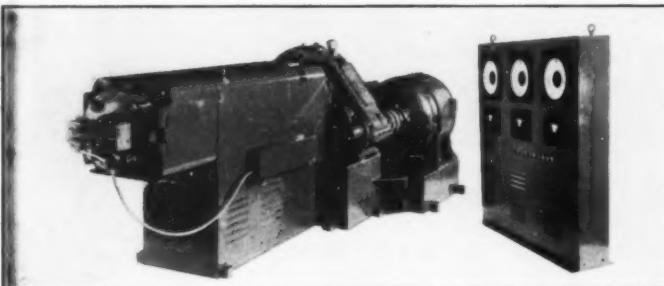


REDUCE YOUR COSTS

## 6" ELECTRICALLY HEATED EXTRUDER ACCLAIMED IDEAL FOR PELLETIZING; ALL OTHER PROCESSES

**Torpedo-type Screw and Balanced Heat Control: Two Exclusive Features Give More Uniform Extrusions at Lower Costs**

The NRM 6" all-electrically heated extruder is an all-round "work-horse" of the plastics extruding industry. NRM's 6" extruder has proved ideal, *on-the-job*, for every kind of standard extrusion process, pelletizing, wire and cable covering, etc.



**NRM 6" electrically heated extruder and control panel. Nominal capacity: 400-500 lbs. per hour. Screw speeds: 8 to 64 rpm. Temperature range: 750° F. 75 hp variable speed drive.**

One of the main reasons for NRM's overwhelming superiority is the fact that NRM pioneered plastics extruders are built *solely* for thermoplastics extrusion. Because of this, NRM has developed features such as the exclusive *Torpedo-type Screw* and *Balanced Heat Control*.

The *Torpedo-type Screw* makes possible maximum production and uniform extrusions with close tolerances when working with rigid compounds such as cellulose acetate, ethyl cellulose, polystyrene . . . and often with elastomeric compounds such as polyethylene.

*Balanced Heat Control* gives you *absolute control over frictional heat with no compressed air, no pipes, no oil or water cooling* at a temperature range up to 750° F.

Find out now how NRM equipment can save you money and improve production quality. Write for complete details to Plastics Division, National Rubber Machinery Company, Akron 8, Ohio.

### 1" Bench Model Extruder suited both for Lab. Work and Regular Production

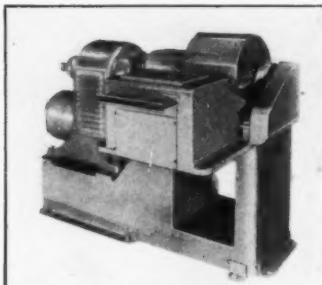
NRM's 1" Bench Model is available both electrically and steam heated. With a nominal capacity of 6-10 lbs. per hour, the Bench Model is *tops* for either laboratory work or small capacity regular production or both. The Bench Model has as an accessory a combination tubing die and wire covering crosshead enabling, for example, experimental work to be done with special materials or small production processes to be carried out.



**From Serrated Strips or Multiple Strands — Up to 1,500 lbs. of Pellets per Hour!**

NRM Choppers are complete units for chopping pre-formed serrated plastic strips or multiple strands of rigid materials into uniform pellets. Nominal capacity is 500 lbs. per hour (Model "500") and 1,000 lbs. per hour (Model "1000"). However, under certain conditions on some installations, production of 1,500 lbs. has been obtained with slight modifications of design.

All NRM Choppers models have forged steel rotors. The four flying Knives and 1 bed Knife of "battle-axe" grade steel are easily adjustable and are replaceable. Drives for the Model "1000" is 10 hp U. S. Varidrive, for Model "500", 5 hp.



**NRM Choppers have welded steel housings with hinged covers for accessibility to the rotor. "Fines" may be removed through a chute which has an easily accessible and replaceable vibrating screen.**

NRM chopping machines team perfectly with other NRM equipment in a pelletizing "line-up". Many typical installations include the famous NRM 6" extruder with the die, the NRM Universal Take-off Conveyor, a water cooling trough and an NRM Chopper for high quantity production of uniform pellets.

For complete details or specifications on any of this equipment, write to NRM at Akron, Ohio.

**ONLY NRM equipment includes sizes ranging from the 1" Bench Model to the huge 12" NRM extruders for special applications. All available for electrical, oil or steam heat.**

### NATIONAL RUBBER MACHINERY CO.

PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.  
AGENTS East: National Rubber Machinery Co., Clifton, N. J.  
West: S. M. Kipp, Box 441, Pasadena 18, Calif.  
EXPORT Plastics Machinery: OMNI EXPORT CORPORATION  
460 4th Ave., New York 16, N. Y.

General Offices & Engineering Laboratories  
Akron 8, Ohio

*Creative  
Engineering*

# 8 Important Reasons—

why it pays Material Manufacturers,  
Compounders and Molders  
to insist on

## CADMOLITH\*

### REDS AND YELLOWS

(Cadmium Red and Yellow Lithopone)

### FOR PLASTIC MATERIALS

- Soft and Easy to Grind
- Non-Fading to Light
- Insoluble in all Vehicles
- Non-Bleeding
- Alkali and Acid Resistant
- Opaque
- High Heat Resistance
- Wide Range of Shades

Whether you are a material manufacturer, a compounder of new or old materials or a plastic molder or coater . . . you can always depend on Glidden Cadmolith\* Colors for the finest results in red and yellow shades. Glidden leadership in research has given these superior colorants properties which not only make your coloring job easier, but produce the finest, most lasting colors in powders and products made from them.

*Send for Folder* giving complete details, with color chips. Write The Glidden Company, Chemical and Pigment Company Division, Union Commerce Building, Cleveland 14, Ohio.

Where a higher degree of opacity is required, *Pure Cadmium Reds* are available in the same range of shades as our Cadmolith\* Red.



\*Trade Mark  
Registered



**SUNOLITH\***  
Lithopone

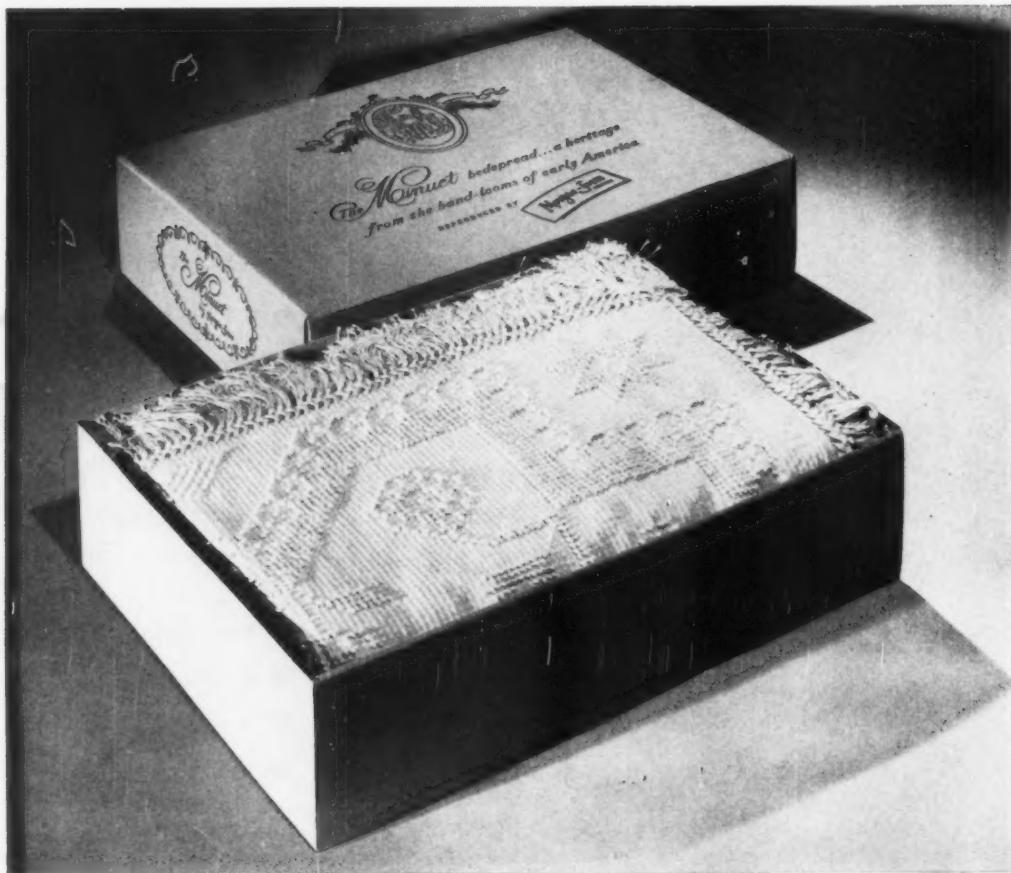
**ASTROLITH\***  
Lithopone

**ZOPAQUE\***  
Titanium Dioxide

**TITANOLITH\***  
Titinated Lithopone

**THE GLIDDEN COMPANY**  
CHEMICAL & PIGMENT COMPANY DIVISION  
Baltimore, Maryland • Collinsville, Illinois • Oakland, California

# Creative Package Design



## this de luxe corrugated prepak®

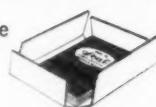
Delivers goods to user factory-packed . . . conveys the impression of a quality product . . . is outstanding in display . . . is attractively printed in light brown ink on blue embossed board . . . identifies, describes, sells the product . . . features the maker's name . . . insures against damage . . . saves one-third in packaging costs. Apply package action to your product and increase sales. Consult Hinde & Dauch, Executive Offices, 5007 Decatur St., Sandusky, Ohio.

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# Custom Molded Plastics for the Automotive Industry... by Erie RESISTOR

Here are plastics that combine harmonizing beauty with a versatile and practical utility... plastics for fittings, plastics for dials, three dimensional plastics for horn buttons, name plates, ornaments... plastics that resist shock, never tarnish, defy time and the elements... plastics whose enduring charm enhances the attractiveness and sales appeal of any car. They are custom molded by Erie Resistor, of course.

*Write for Erie Resistor's interesting booklet on plastics, "What We Are — What We Do."*

One of a series of advertisements showing Erie Resistor Custom Molded Plastics used in various industries.

Plastics Division  
**ERIE RESISTOR CORP., ERIE, PA.**  
LONDON, ENGLAND . . . TORONTO, CANADA

# FURFURYL ALCOHOL RESINS

## PROMINENT IN ACID, ALKALI AND SOLVENT-PROOF CONSTRUCTION



PERMANITE\* PIPE AND DUCT MADE BY  
MAURICE A. KNIGHT COMPANY,  
AKRON 9, OHIO



Permanite chemical resistant pipe and fume duct is constructed of furfuryl alcohol resin reinforced with glass fabric or synthetic fiber. The resin gives outstanding acid, alkali and solvent resistance to the finished article, while the combination of fabric plus resin contributes other features including light weight, strong impact resistance, smooth interiors and easy manipulation in the field. Joining the pipe or duct is easily accomplished either by use of flanges or by use of a wrapped joint impregnated with a furfuryl alcohol resin which may be cured at room temperatures. Such a joint is also resistant to chemical attack.

The Quaker Oats Company does not manufacture furfuryl alcohol resins but is glad to put you in touch with suppliers. If you would like general information about furfuryl alcohol itself, ask for a copy of Bulletin 83-A.

★ Permanite is the name given to Knight developed resin materials which are used in fabricated forms such as the pipe and duct shown, as well as in chemical resistant cements, coatings and reinforcing armor for stoneware.

*IMPORTANT NOTICE: New Address: The Quaker Oats Company  
is now located at the Merchandise Mart, Chicago 54, Illinois*



**The Quaker Oats Company**

337C MERCHANTISE MART, CHICAGO 54, ILLINOIS

EASTERN SALES OFFICE  
1240C WHITEHALL BLDG., NEW YORK 4, N. Y.

In San Francisco, The Griffin Chemical Company. In Australia, Swift & Company, Pty., Ltd., Sydney  
In Europe Quaker Oats-Groenproducten N.V., Rotterdam, The Netherlands; Quaker Oats (France) S.A. 42, Rue Pasquier, Paris 8E, France

**CHEMICALS DEPT.**

# DOUBLE DUTY

R. D. WOOD  
HYDRAULIC  
PRESS

This press has a 1000-ton capacity, but it's evidence in various sizes and capacities. Moving platen working surface is 34" x 26". Fixed platen are 66" x 26" x 3". Arranged for semi-automatic and manual operation, and completely self-contained, the press stands 7' above the floor line.



Design pays off in this R. D. Wood multiple-opening platen press! It's used for polishing operations for plastics . . . doubles as an embossing press. Change over is easy: The three upper steam platens are secured in "up" position, and platen stop pins are inserted under the moving platen, providing a single opening. The embossing die is attached to the under side of #3 platen, and the bottom steam platen is used as an embossing anvil. Both operations of polishing and embossing are sure, fast, accurate.

If your production could use *two presses in one*, get in touch with us about this press. Or if you have other hydraulic press problems or needs, why not take advantage of 150 years of R. D. Wood engineering experience?

HYDRAULIC PRESSES AND MANUFACTURES FOR EVERY PURPOSE  
ACCUMULATORS, CYLINDERS, CYLINDER HEADS, CYLINDER SPLITTERS, CYLINDER SPLITTERS



*R.D. Wood Company*

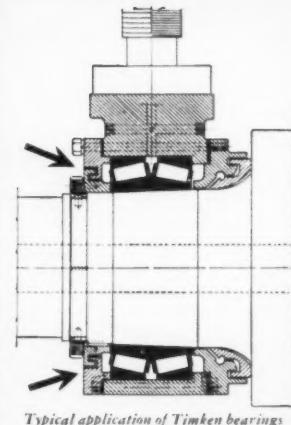
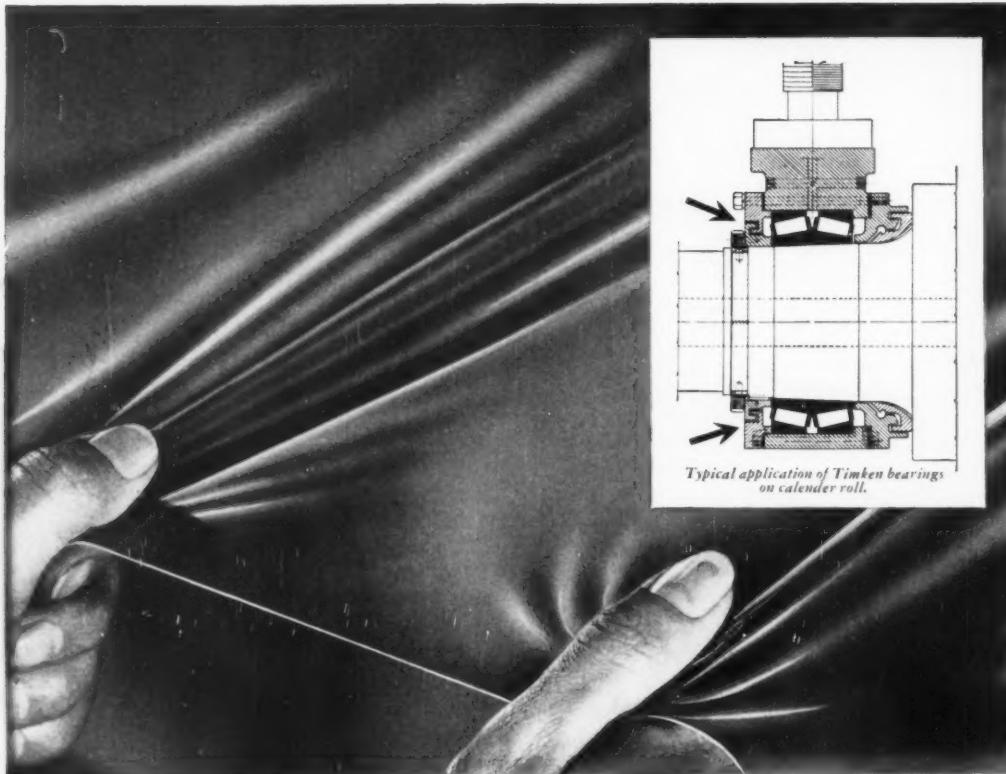
Est. 1803

## What makes this Wood Press a Good Press?



Part of the story . . . is the R. D. Wood press platen, a piece of precision manufacturing. Practically any degree of parallelism required is maintained within the size ranges of 7' x 34' or 8' x 26'. Uniform heat distribution over top and bottom surfaces is achieved by precise drilling on special machines, carefully designed steam circulation channels. Finishes range from smooth tool to high polish, worked on specially processed fire box steel plate. Write for the full story.

# New way to get uniform thickness and color in your plastic sheets



**N**OW you can get *consistent* gage and color in your plastic sheets. Now you can cut losses due to rejects and too-thick sheets.

The secret is in the precision of your calenders — the kind of *extreme* precision you get when the calender rolls are mounted on *Timken®* tapered roller bearings (see sketch above).

Unlike plain bearings, Timken bearings can be adjusted very precisely at installation to allow for roll expansion caused by heat. Vertical roll movement is held to a minimum, calender precision is maintained!

What's more, this precision *lasts*. Timken bearings provide greater roll rigidity because their tapered construction takes any combination of radial and thrust loads. Because they carry the greatest loads — thanks to line contact between rolls and races.

Timken bearings on your calenders, mills, refineries and banbury mixers can help you improve the quality of your plastics, cut losses, and reduce maintenance costs. Get full details. Write to The Timken Roller Bearing Company, Canton 6, O. Cable address: "TIMROSCO".

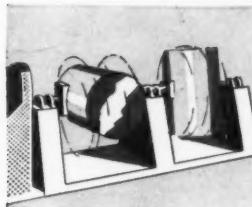
**TIMKEN**  
TIMKEN ROLLER BEARING CO.

**TAPERED ROLLER BEARINGS**



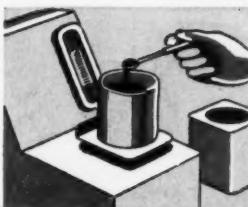
NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

# 4 easy steps to lower unit costs



3. Add, dry, to "Colorant-Blend" styrene . . .

4. Tumble 10-30 minutes with simple, inexpensive equipment.



1. Weigh Lustrex "Colorant-Blend" crystal styrene . . .

2. Measure colorant . . .

... by direct molding  
with Monsanto's New  
"Colorant-Blend" Lustrex Styrene

**19 Bright, Lustrous Colors  
New Savings in Materials Cost  
Dusting Minimized  
Inexpensive Tumbling Equipment  
Good Moldability  
Maximum Coloring Results**

Bright, lustrous, practical colors in styrene... that costs less! Think how this new, proven dry coloring process—and Monsanto's new Lustrex "Colorant-Blend" styrene can help you reduce unit costs...broaden markets, and boost sales and profits.

Here's a wide range of brilliant, light and heat stable colors in transparents, translucents, opaques, metallics. Utility colors with excellent distribution...little or no mottling or streaking.

Best of all, intermediate compounding... costly equipment and expense...are eliminated. You mold directly after blending. Typical cost of dry coloring varies from only  $\frac{1}{2}$  cent to  $1\frac{1}{2}$  cents per pound...substan-

tially less than the added cost of colored styrene. A direct conversion saving of several cents on every pound you buy. Tumbling equipment can be simple and inexpensive.

And, remember—there's little or no dust problem when you use Monsanto's "Colorant-Blend" Lustrex. Tiny, rough-cut crystal Lustrex granules improve dispersion and adhesion, minimize aggravating dusting of dyestuffs.

For toys, housewares, novelties, or other products where complete color uniformity is not essential, it will pay you to investigate this new low cost dry coloring process...and Monsanto's new "Colorant-Blend" styrene...now.

Lustrex: Reg. U. S. Pat. Off.

Write today for  
full information. The  
coupon is for  
your convenience.

MONSANTO CHEMICAL COMPANY, Plastics Division  
Dept. MPL29, Springfield 2, Mass.

Please send me full information on dry coloring  
Monsanto's Lustrex "Colorant-Blend" styrene.

Name & Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City, Zone, State \_\_\_\_\_

**MONSANTO**  
CHEMICALS - PLASTICS

SERVING INDUSTRY...  
WHICH SERVES MANKIND

# PACKED FOR *Profits!*



**Specialized, rigid plastic containers  
by Bridgeport Moulded give your product new sales appeal!**

The *right* package, the *right* plastic, the *right* craftsmanship — add up to real sales power for *your product*.

Bridgeport Moulded has the experience, the knowledge, and the equipment — the most modern, efficient presses available — to produce rigid plastic containers of the highest quality.

Better look into the possibilities of plastic for your product packaging. Bridgeport Moulded has helped supply rigid plastic packages that are now making sales history. Why not call on our specialized plastic package service at once? We will be glad to analyze your needs and make recommendations. *Write to . . .*

**BRIDGEPORT MOULDED PRODUCTS, INCORPORATED**

BOX 3276-O BARNUM STATION



BRIDGEPORT 5, CONNECTICUT

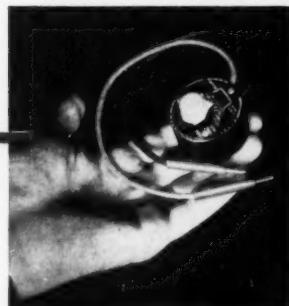
# Koppers Polystyrene 8

FOR THE BEST COMBINATION OF

ELECTRICAL, THERMAL  
AND CHEMICAL PROPERTIES

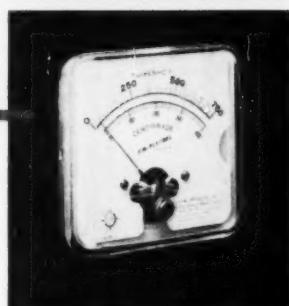
## INSTRUMENT CASE

Molded of Koppers Polystyrene 8 because of its excellent electrical properties and low cost. Made by Industrial Devices, Inc., Edgewater, N. J.



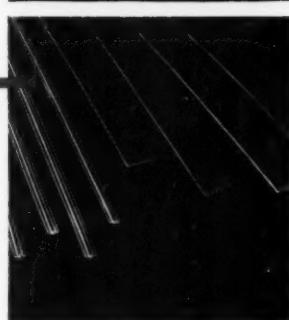
## PYROMETER CASE

Molded of Koppers Polystyrene 8 to obtain extra heat resistance, and add crystal clarity combined with good dimensional stability to assure a close-fitting cover. Molded by Majestic Molding Co., Elvira, Ohio, for Assembly Products Inc., Chagrin Falls, Ohio.



## PLATE SEPARATORS

Used to separate the positive and negative plates of "NICAD" Alkaline storage batteries. Extruded Koppers Polystyrene 8 was used for its high resistance to chemical deterioration, extra heat resistance, plus its high electrical insulating properties. Supplied by R. E. Hartung Co., Inc., New York City for Nickel-Cadmium Battery Co., Easthampton, Mass.



● Compare these properties of Koppers Polystyrene 8 with those of other rigid plastics and other polystyrenes. You'll find Koppers Polystyrene 8 offers the best combination of properties for many electrical and mechanical applications.

**ELECTRICAL PROPERTIES.** Koppers Polystyrene 8 is unsurpassed, with the highest dielectric strength and the lowest power factor.

**THERMAL PROPERTIES.** Koppers Polystyrene 8 is among the highest in heat distortion temperature of all commercially available polystyrenes — minimum 200° F. under the A.S.T.M. Test D 648-45T. Polystyrenes, as a class, have the lowest thermal conductivity of the common plastic molding materials.

**CHEMICAL PROPERTIES.** Polystyrenes rate first in resistance to water and all concentrations of acids and alkalies.

This combination of properties—excellent electrical characteristics, improved heat distortion temperature and superior chemical properties makes Koppers Polystyrene 8 first choice for numerous electrical applications including television insulators, instruments, meters, battery cases and many parts of appliances.

Add to this an unlimited choice of colors plus a faster molding cycle and low price and you can see why Koppers Polystyrene 8 is rapidly becoming the most widely used plastic molding material.

## KOPPERS COMPANY, INC.

Chemical Division      Pittsburgh 19, Pa.

Regional offices: New York, Boston, Philadelphia, Chicago, Detroit and Los Angeles

## SEND FOR NEW BOOKLET



Koppers Company, Inc.  
Chemical Division, Dept. MP-5  
Pittsburgh 19, Pa.

Please send your booklet on Koppers 1950 Polystyrenes.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

**Koppers** *perfected* **Plastics**



## *Plastics for* INDUSTRY

The 1950 Mercury car features an all plastic instrument cluster dial scale as illustrated above.

Molded in Acrylic, with lettering and numerals filled in with white, the plastic scale adds greatly to the beauty and utility of the new 1950 Mercury dashboard.

# CRUVER

**MANUFACTURING CO.**

2460 W. JACKSON BLVD., CHICAGO 12, ILL.

BRANCH OFFICES  
DETROIT            MINNEAPOLIS            NEW YORK  
CLEVELAND    ST. LOUIS



Assured Uniformity and Purity...

HEYDEN

# FORMALDEHYDE

The manufacture of fine plastic tableware is a typical example of a process requiring highly uniform and pure chemicals. Such uniformity and purity are assured in Heyden Formaldehyde through the use of pure raw materials and rigid laboratory control.

Regardless of the industry it serves—plastics, textiles, paper, adhesives, dyes—Heyden Formaldehyde imparts superior quality to the finished product.

A clear, colorless solution free of impurities, Heyden Formaldehyde assays not less than 37% by weight. It is available as Formaldehyde Solution U.S.P. or as Methanol-free Formaldehyde.

• • •

Shipped in tank cars, tank trucks, drums, carboys and bottles.

• • •

*Also available in unlimited quantities:*

**PARAFORMALDEHYDE • HEXAMETHYLENETETRAMINE**

**Serving Industry THROUGH FINER CHEMICALS**



**HEYDEN**  
**CHEMICAL CORPORATION**

393 SEVENTH AVENUE, NEW YORK 1, N. Y.

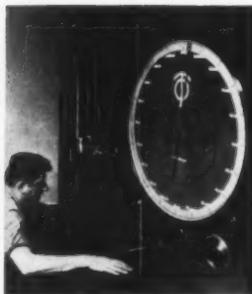
CHICAGO 6 • PHILADELPHIA 3

SAN FRANCISCO 11 • RUMFORD 16, R. I.

Benzaldehyde • Benzoates • Benzyl Chloride • Bromides • Chlorinated Aromatics • Creosotes • Formaldehyde  
Formic Acid • Glycerophosphates • Guaiacols • Hexamethylenetetramine  
Medicinal Colloids • Methylene Disalicylic Acid • Paraformaldehyde • Parahydroxybenzoates • Penicillin  
Pentaerythritols • Propyl Gallate • Quadratos • Salicylates • Salicylic Acid • Streptomycin

# Metasap Stearates smooth the way

to increased output...  
lower production costs...  
better molded products



Testing the effect of Metasap Calcium Stearate in molding compounds at the Watertown Manufacturing Company plant, Watertown, Connecticut.

Results obtained at Watertown, over a long test run, have demonstrated that preforms containing Metasap Calcium Stearate can be ejected, in perfect shape, with less than 25% of the pressure required for those that do not contain this outstanding lubricant.

**Prove this for yourself . . .** Simply mold two sets of similar preforms from (a) a molding compound containing Metasap Calcium Stearate, and (b) the same compound without the stearate. Determine the pressures required to eject these preforms from their respective molds, by subjecting them to precision tests on a "Plastiversal" or similar testing machine.

You'll find that preforms which contain Metasap Calcium Stearate will be ejected much more easily than those which do not.

**Here's the evidence . . .** that Metasap Stearates operate to effect substantial production economies all along the line . . . and assure better products, too. For lower ejection pressures provide the following important advantages:

Preforms not containing Metasap Calcium Stearate require 50-lbs. of pressure in order to eject them from mold. Often they are delaminated in the ejection process, as shown below.



Preforms containing Metasap Calcium Stearate are easily released with only 10-lbs. of pressure. Delamination is thus avoided, and perfect preforms obtained (see photograph below).



**With preforms**—molding can be done with machine of less tonnage;  
—delamination, due to high pressures, is avoided;  
—molding materials are conserved (because of little or no preform breakage).

**With finished products**—output is increased (because molded pieces are quickly and easily released from molds);  
—rejects are decreased (because clean-cut pieces with more marketable finish are obtained).

IN ADDITION, mold life is increased because molds are not stained, and scoring is practically eliminated.

If you employ intricate mold designs and stress high precision fabrication, you will find Metasap lubrication especially advantageous.

For complete information, write  
**METASAP CHEMICAL COMPANY, HARRISON, N. J.**  
Chicago • Boston • Richmond, Calif. • Cedartown, Ga.



## Stearates

of Calcium • Aluminum • Lead • Magnesium • Zinc

# The New RC-65

## ...low-cost, all-purpose extruder



### SPECIFICATIONS

AVERAGE OUTPUT ..... 66 lb/hr.\*

NUMBER OF SCREWS ..... 2

DIAMETER OF SCREWS ..... 3.15"-3.54"

MOTOR  
horsepower ..... 5  
speeds ..... 3-speed  
(6, 9, 12 rpm)

SHIPPING WEIGHT (approx.) ..... 2185 lb.

FLOOR SPACE

extruder ..... 2'6" x 3'6"  
control panel ..... 2'3" x 2'3"

HOPPER FEED ..... Fully automatic, rotating  
type...geared to screw speeds

LUBRICATION ..... Forced-feed to all gears  
and bearings

FOUNDATIONS ..... None required

\*Rates are appreciably higher when these models are used for the  
straight extruding of pre-colored, pre-plasticized compounds.

Write for details now.



*R. H. Windsor Ltd.*

MANUFACTURERS UNDER I.M.P. PATENTS

16 FINSBURY SQUARE LONDON E.C.2 ENGLAND

Telegrams: TECHNIMACH FINSQUARE LONDON • Cables: TECHNIMACH LONDON

It does all six jobs . . .

1. Compounds
2. Colors
3. Plasticizes
4. Makes pellets
5. Recalms scrap
6. Extrudes (from .010" monofilaments to 10" tubas, strips, special sections)

IMPORTANT NOTE: Higher output models are available — the twin-screw RC-100 with an average production of 100 pounds per hour, and the triple-screw RC-200 with an average production of 200 pounds per hour. Send for particulars.

Sole U. S. and Canadian Distributor  
**JACKSON & CHURCH COMPANY**  
Saginaw, Michigan

# PVA

## FOR LOW PRESSURE AND CONTINUOUS LAMINATING

The specialization of Reynolds Plastics Division in tough, fine-mil cast film makes available films particularly suited to low pressure and continuous laminating—water-soluble Polyvinyl Alcohol.

Many laminators are turning to Reynolon 4101 (1 mil) because of its extremely high yield per pound. However, where greater strength or re-use through regeneration is required, the heavier gauges (1½, 2, 3 and 4-mil) are frequently used.

Reynolds development of this film stems from its long experience in laminating packaging materials utilizing Aluminum Foil, of which the company is the world's largest producer. Reynolds also produces a general vinyl series—Reynolon 5000. Write for details.

### REYNOLON 4000 SERIES—POLYVINYL ALCOHOL

Forms available . . . . . Rolls and sheets (1)  
Refractive index . . . . . 1.49-1.53 (2)  
Thickness range, in. . . . . 0.001"-0.004" (1)  
Maximum width, in. . . . . 40" (1)  
Area factor, sq. in. /lb. . . 10,000 (.002") (2)  
Specific gravity—approx. . . 1.21-1.31 (2)  
Tensile strength, lb. /sq. in. . 7800-8000 (1)  
Elongation % . . . . . 185-253 (1)  
Tearing strength (Elmendorf) gms. . High (1)  
Water absorption, % (24 hrs., ½") . 30 up (2)  
Resistance to acids . . . Swells or dissolves (2)  
Resistance to alkalis . . . Swells or dissolves (2)  
Resistance to greases and oils . . Excellent (2)

Resistance to organic solvents . . . . .  
. . . . . Unaffected, extremely resistant (2)  
Resistance to sunlight . . . . . Excellent (2)  
Thermal expansion, 10<sup>5</sup> per °C . . 7-12 (2)  
Resistance to storage . . . . . Good\* (2)  
Flammability—in. sec. . . . . 2.0 (1)  
Taste . . . . . None (2)  
Toxicity . . . . . None (2)  
Odor . . . . . None (2)  
Heat sealing temp. °F . . . . .  
. . . . . Below 310 (5 sec. contact)

(\*Affected by high Relative Humidity)

(1) Reynolds data.

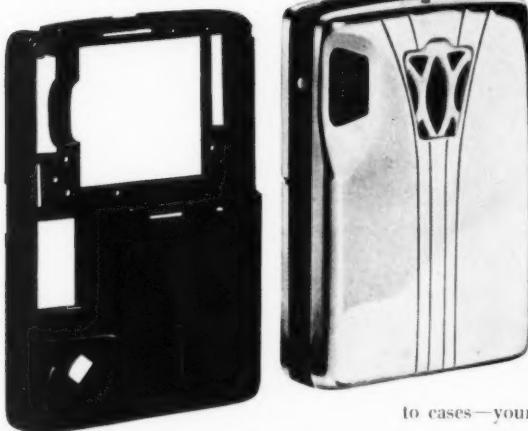
(2) Data from printed outside sources.



**REYNOLDS METALS COMPANY  
PLASTICS DIVISION**  
19 EAST 47TH STREET, NEW YORK 17, N.Y.



*Hearing aid case,  
molded for Beltone, Chicago*



Write on your letterhead for  
the new Injection-Molded and  
Extruded Plastic Catalog.  
Or, for detailed information  
about ~~CO-EX~~ <sup>CO-EX</sup> piping,  
tubing and fittings, write for circulars  
containing data and illustrations.

\*Trademark Registered



You can get a lot of help for your plastic problems from our plastic case histories. Take this Beltone hearing aid case for example.

Here is compactness, durability and attractive modern design. Look carefully and you can also see some intricate interior work that required precision tolerances in molding. We've also molded a wide variety of other plastic cases—small cases—large cases—simple cases—complex cases. Each solved a distinct problem while increasing product appeal.

Let us put this experience at your profitable disposal. Just tell us today when we may get down to cases—your cases, or any other injection molding or extrusion problem. Our assistance is yours without obligation.

#### ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacel, Fibestos, Lucite, Nylon, Plexiglas, Polystyrene, Styron, Loalin, Vinylite, Geon, Plexene, Polyethylene, Cerex, Forticel, ~~CO-EX~~ <sup>CO-EX</sup>, Saran, and other Thermoplastic Materials.

2930 NORTH ASHLAND AVENUE • CHICAGO 13, ILLINOIS

# HUGE TWIN CAVITIES AT MPc MOLD

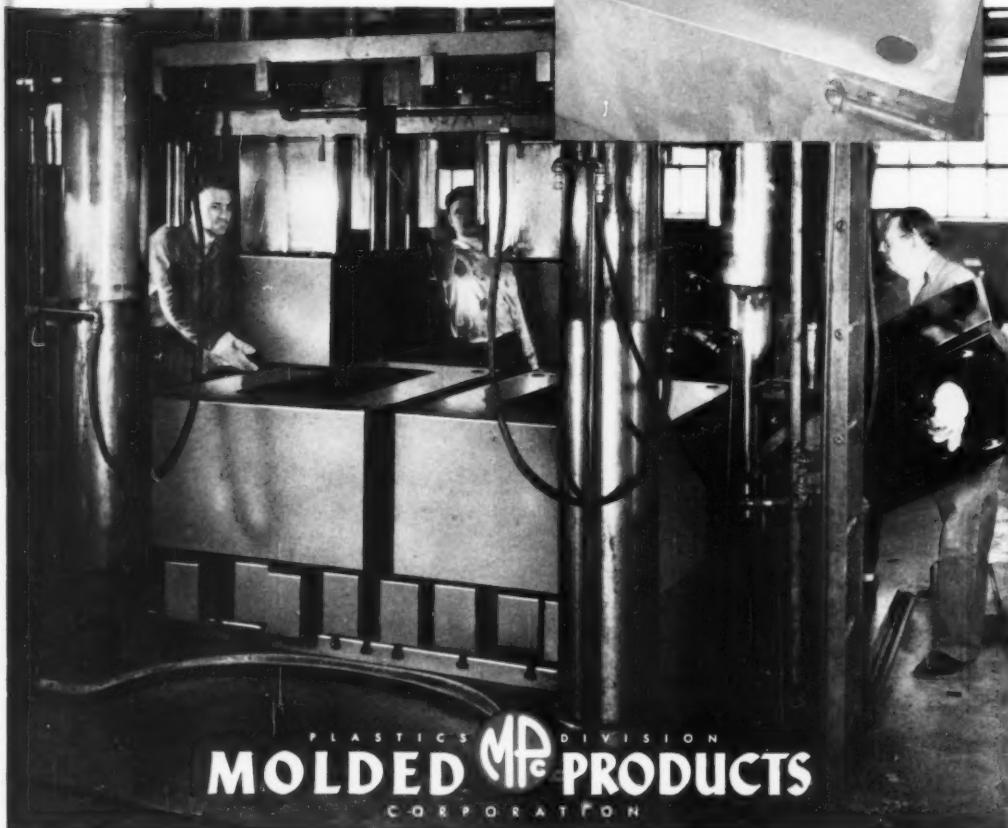
80 lbs.  
per cycle

Fantastic? Incredible? So it would have seemed...as recently as two short years ago.

Today the production of these huge castings is routine reality at **MPc**. Every five minutes, around the clock, the towering 2500 ton press produces two complete console cabinets for Admiral 12½ inch television receivers.

**MPc** has paced the advance to ever-larger plastic castings with special multi-thousand ton presses, with unique tool-room equipment...yes, and with the vision, the enterprise, the daring to attempt molded pieces of a size and bulk never before approached.

At **MPc** an unparalleled fund of experience...plus unmatched production facilities...are available to product designers with big ideas in plastics. Address **MOLDED PRODUCTS CORPORATION**, 4535 W. Harrison St., Chicago 24, Illinois.



# NIxon PLASTICS

## **Sheets • Rods • Tubes**

cellulose acetate (Nixon C/A)

cellulose nitrate (Nixon C/N)

ethyl cellulose (Nixon E/C)

cellulose acetate butyrate (Nixon C/A/B)

## **Molding Compounds**

cellulose acetate

ethyl cellulose

... and now

## **rigid VINYL sheeting** (Nixon V/L)

for close personal service on  
orders large or small,  
contact...

# NIxon NITRATION WORKS

Nixon • New Jersey

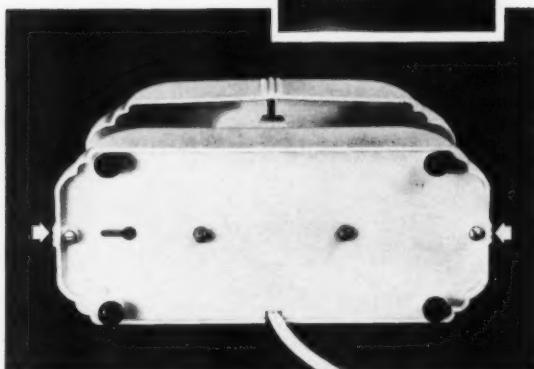
Chicago Office: 510 N. Dearborn Street, Chicago 10, Ill.

## How to make planned assembly savings pay off



### SAVES 40% IN ASSEMBLY TIME

Hungerford Plastics Corp., manufacturers of this LAZY-LITE Bed Lamp, compared costs of fastening by other methods, found that the simpler P-K method, eliminating tapping and inserts, resulted in a saving of 40%. Two Type Z Self-tapping Screws are used to fasten the cellulose acetate base plate to the polystyrene lamp body. Find out how you can make similar savings in time, avoid breakage, and add strength.



## Don't let screw failure cancel savings



Choose

P-K\* Screws ... avoid slowdowns and scrapped parts

TYPE Z  
(Also made with  
Phillips head)

NEED SPECIAL SMALL SIZE  
SELF-TAPPING SCREWS WITH  
PHILLIPS RECESSED HEADS?  
P-K Type A or Z, in No. 0 or  
No. 1 diameter, with a No. 0  
Phillips Recess, can be made  
to order, quantity permitting.

Three steps are needed to insure assembly savings. First, engineer your assembly for minimum cost. Next, select the simplest, speediest fastening method. Then, if as in most cases, you find this to be with Self-tapping Screws, use the best that money can buy. For, if screws run offsize, if they break or otherwise fail, all your carefully planned savings are lost.

Parker-Kalon, originators of Self-tapping Screws, learned long ago how to keep hardness and toughness properly balanced in every screw—learned to maintain the uniform quality that keeps assembly humming. And there's no substitute for 35 years experience.

Remember, the actual cost of screws depends, never on price, always on performance. Specify Parker-Kalon, and you'll see why the makers of thousands of the nation's best known products say—IF IT'S P-K . . . IT'S O. K.!

Parker-Kalon Corporation, 200 Varick St., New York 14, N.Y.  
Sold everywhere through accredited Distributors.

\*TRADE MARKS REG. U. S. PAT. OFF.



*The Original*  
**PARKER-KALON<sup>®</sup> SELF-TAPPING SCREWS**

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY



## COMPOUNDED ESPECIALLY FOR PLASTIC MOLDING

Watson-Standard Vinyl Plastics are the ideal molding compounds for the utmost in life-like appearance, feel and fineness of detail for doll heads and component parts, crib toys, animals, puppets and flexible objects. You almost expect them to come to life.

Watson-Standard Vinyl Plastics have properties heretofore not available with other types of plastics. Their characteristics include permanent flexibility, good chemical resistance, excellent durability and ease of molding.

They are not of standardized formula, but are compounded especially to meet the individual needs of each application. We will be glad to consult with you on your problem. Write us today.

Give us your plastic problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

**THE WATSON-STANDARD CO.**  
225 Galveston Ave. Pittsburgh 30, Pa.  
New York Sales Office: 15 Park Row, New York 7, N. Y.

One of a Series of  
Messages to the Buyer  
of Custom Molded Plastics

# All Ways Alike!

## "Statistical Quality Control" goes Mrs. Pod more-than-one better!

The original *Mrs. Pod*, unconcerned about specifications, delivers nature-molded pieces which, to the eye, need only *look alike* in appearance and size!

"Statistical Quality Control" goes much further. As a special production-improvement factor . . . and with the custom molder's press as its *pod*, each delivered part must fully comply with each and every required specification! Not only must parts look alike—they must be alike! . . . Size—shape—molding uniformity—precision placement of inserts—together with a multiplicity of inside and outside measurements . . . all, in *all* ways, must pass rigid tests before passing to the customer.

With "Statistical Quality Control" in force, few parts ever get the chance to develop an inferiority complex. The method raises the standard of an entire output and saves the customer the need and the cost of double inspections.

Whenever you are projecting a part—to be molded of plastic—and one that must toe the specifications line—call in a Consolidated sales engineer. Any one of our quickly reached offices is ready to apply experience, know-how and savings to your custom plastics problem.

Please address Dept. G-5

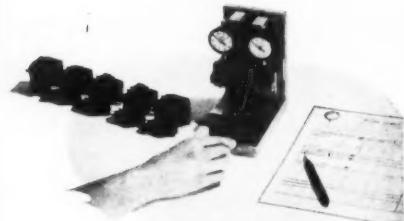
## Consolidated Molded Products Corporation

Plant & Executive Offices: 309 CHERRY ST., SCRANTON 2, PA.

Branch Offices and Representatives in New York, Chicago, Detroit, Cleveland, Bridgeport,  
Philadelphia—and other principal cities



## "STATISTICAL QUALITY CONTROL" at Work!



The system, one of  
scientific sampling, is documented by  
regular timings, gauge readings, jig  
constructions, graph plottings. In the hands of  
Consolidated's skilled plastics technicians, "S. Q. C."  
can't help but insure you the kind of plastics  
production that makes for a  
strong custom-molding  
relationship.



A Million Dollars in  
Custom Molding Facili-  
ties to Guarantee "Your  
Blueprint in Plastic" . . .  
with Savings!

# NEW ACHIEVEMENTS IN PLASTICS



HINDS HONEY & ALMOND FRAGRANCE CREAM in an 8-ounce Plaxpak bottle retails for 79 cents. Features emphasized are: "Easy to use — just tilt bottle and squeeze . . . built-in dispenser . . . unbreakable . . . refillable . . . and also economical."



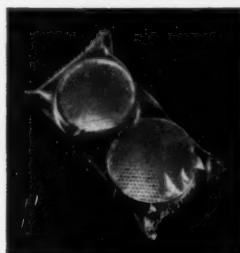
NOW THE HOUSEWIFE has Plaxpak polyethylene film in rolls. From her own experience, she knows that products are better protected in Plaxpak. It's quite natural that she will have preference for those products because she will know they are packaged well.



LEG FORM fabricated of flesh-colored Plax methacrylate tubing provides an attractive, lightweight and durable display for feminine hosiery. Manufactured by Just Plastics, Inc., New York, N. Y., it features a flattering product keeping it free of snags.



HURRIED, ACTIVE MEN will appreciate Spotsman's Airlite Shaving Lotion, Cologne and Deodorant all the more — now that they are "Airlite" in Plaxpak bottles. The unbreakable, flexible containers can be handled quickly without fear of breakage.



DRYING OUT OF CHARCOAL in respirator cartridges is prevented by sealing them in a Plaxpak polyethylene bag. Low moisture transmission rate of Plaxpak film keeps cartridges "fresh" in storage. Film also keeps them hygienically clean.



LIGHT AS A FEATHER, this new toy airplane of Plax Poliflex<sup>®</sup> polystyrene is beautifully balanced for flight and sturdy enough to take some bumping. Made by Skycraft Mfg. Co., Long Beach, Calif., its high flying will be the delight of air-minded youngsters.

Plax maintains a number of services for the benefit of those who wish to take maximum advantage of plastics materials. Our technical group is prepared to add its accumulated knowledge and experience to yours in material selection and in solving production problems. Laboratory facilities are also available for aid in research and development. Merchandising guidance is another service Plax has to offer on consumer applications of Plaxpak packaging materials and Polyflex<sup>®</sup>.

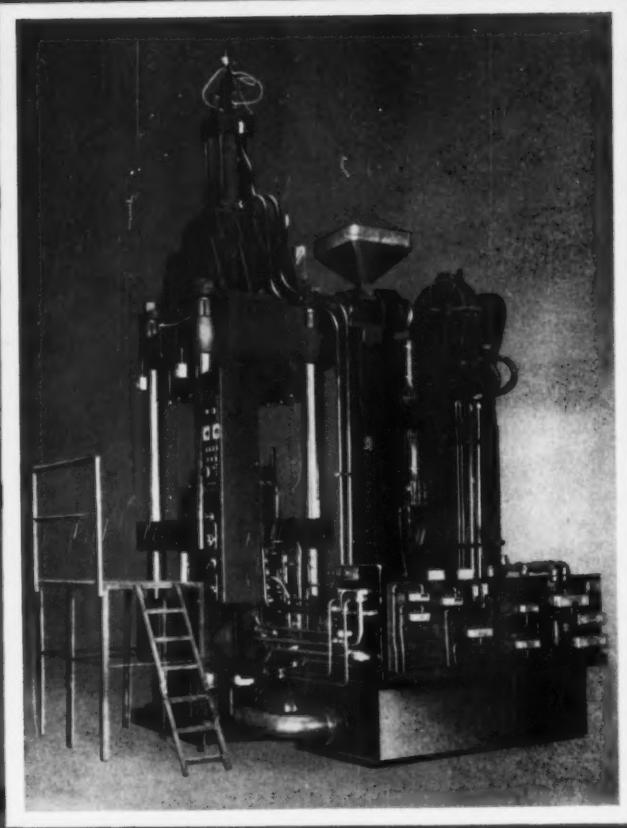
PLAX BLOW-MOLDED PRODUCTS ARE MADE UNDER THE FOLLOWING U. S. PATENTS: 2126270, 2126271, 2126272, 2230100, 2230102, 2230103, 2230104, 2230105, 2230106, 2230107, 2230108, 2230109, 2230110, 2230111, 2230112, 2230113, 2230114, 2230115, 2230116, 2230117, 2230118. \*TRADE MARK REG. U. S. PATENT OFFICE.

**PLAX CORPORATION**

Offices in New York City, Syracuse, Philadelphia, Cincinnati, Chicago, St. Louis and Houston



P. O. BOX 1019, HARTFORD 1, CONNECTICUT  
In Canada, Canadian Industries, Ltd., Montreal



40 SECOND  
CYCLE

500 SQ. INCHES  
PROJECTED AREA

500 TONS  
LOCKING PRESSURE

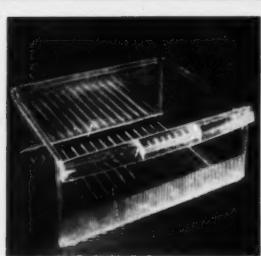
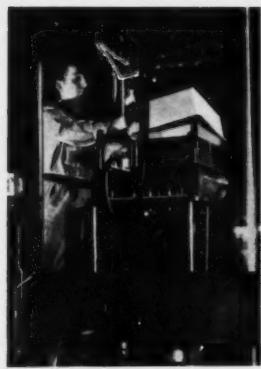
**SPECIFICATIONS — 64 OZ. MODEL**

Ounces Per Shot	64 oz. (Styrene)
Time Cycle for 64 Oz.	40 Seconds
Total Production Per Hour	410 Lbs. (Styrene)
Pressure Per Square Inch on Material in Injection Chamber	12,000 p.s.i. Maximum
Diameter of Plunger	3½" Diameter
Diameter of Screw	4½" Diameter
Speed of Screw	25 to 200 r.p.m.
Projected Area	300 Square Inches
Locking Pressure	500 Tons 573 Active
Stroke of Clamoy Cylinder	27" Min. 34" Maximum

Speed of Closing	500 inches Per Minute Slowed Down to 60 inches Per Min. for Clamping
Speed of Opening	450 inches Per Minute Slow Down for Knock-Out
Maximum Overall Height	19' 10" to 21' 4"
Maximum Daylight Opening	34" to 64"
Minimum Daylight Opening	9" to 36"
Distance Between Tie Rods	Left to Right 34" Front to Back 34"
Floor Space Required	102 Square Feet
Approximate Weight	46,000 Pounds

**AVAILABLE IN 24, 48, 64, AND 80-OZ. MODELS**

\*Patent Applied For



Import material manufactured by Dow Chemical Co. Cycle 1 min. 12 sec.

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TO DATE: on injection molding machines of conventional design, the injection chamber and its ability to plasticize material has been the limiting feature.

NOW: on a Jackson & Church Pre-plasticizing Press\* the mold is the limiting feature. When the mold says . . . "Take the piece out" . . . the next shot is ready to go.

The Jackson & Church pre-plasticizer is new . . . sets new standards for coloring and injection molding . . . affords opportunities unlimited and capacities and time saving never heretofore possible. When buying Jackson & Church equipment . . . you get the most outstanding engineering advice on pre-plasticizing in the world. Unquestioned leaders in this phase of plastic molding . . . Jackson & Church Company and its associates, consistently maintain and equip laboratories with full size equipment to assist industry with short and long range problems. Glance at the specifications for the new 64 oz. machine and you can see why Jackson & Church Presses have attracted the attention of the leaders of the plastic industry. Here are additional reasons for its popularity:

1. Pre-plasticizing member has four zone temperature control, with specially designed stainless steel hopper and extruder pump. It has also water-cooled thrust bearing and leak-proof lubricant seals, as well as standard coupling and gear boxes for easy maintenance.
2. A trouble-free injection chamber that eliminates bothersome torpedos . . . a two-zone temperature control with coefficients of thermal expansion closely controlled, and a temperature controlled upper head to guard against expansion of press.
3. Drive for pre-plasticizing member has trouble-free fluid motor with standard V-belt and sheave drive, also proven gland for temperature control within extruder pump screw.
4. Hydraulic unit is self-contained and automatically electrically controlled. All piping is external with all pumps vented to tank under no pressure during idle cycle.

THINK OF IT! . . . 410 lbs. of styrene per hour . . . 500 square inches projected area . . . 40 second cycle . . . 500 tons locking pressure. WE REPEAT . . . with the Jackson & Church Press your opportunities are unlimited—with mold design only limiting factor.

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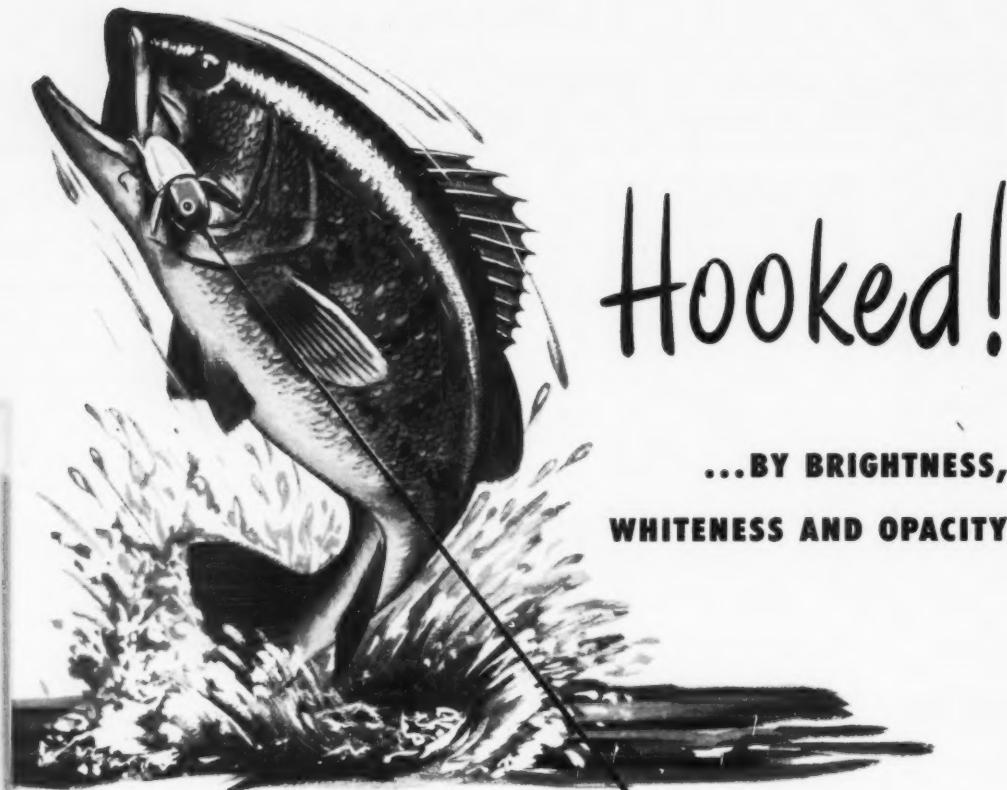


# JACKSON & CHURCH CO.

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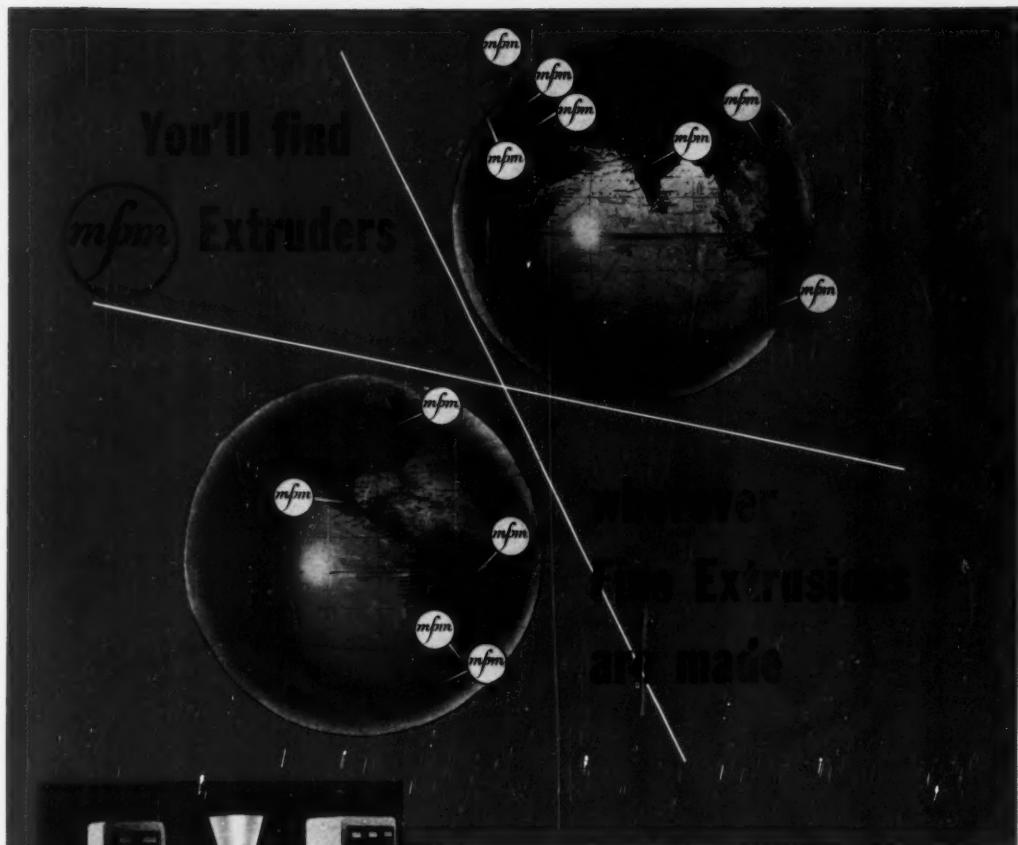
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Clear and colored transparencents for windshields. Delicate pastels, superior light diffusion...no color loss...color clear through (not coated).



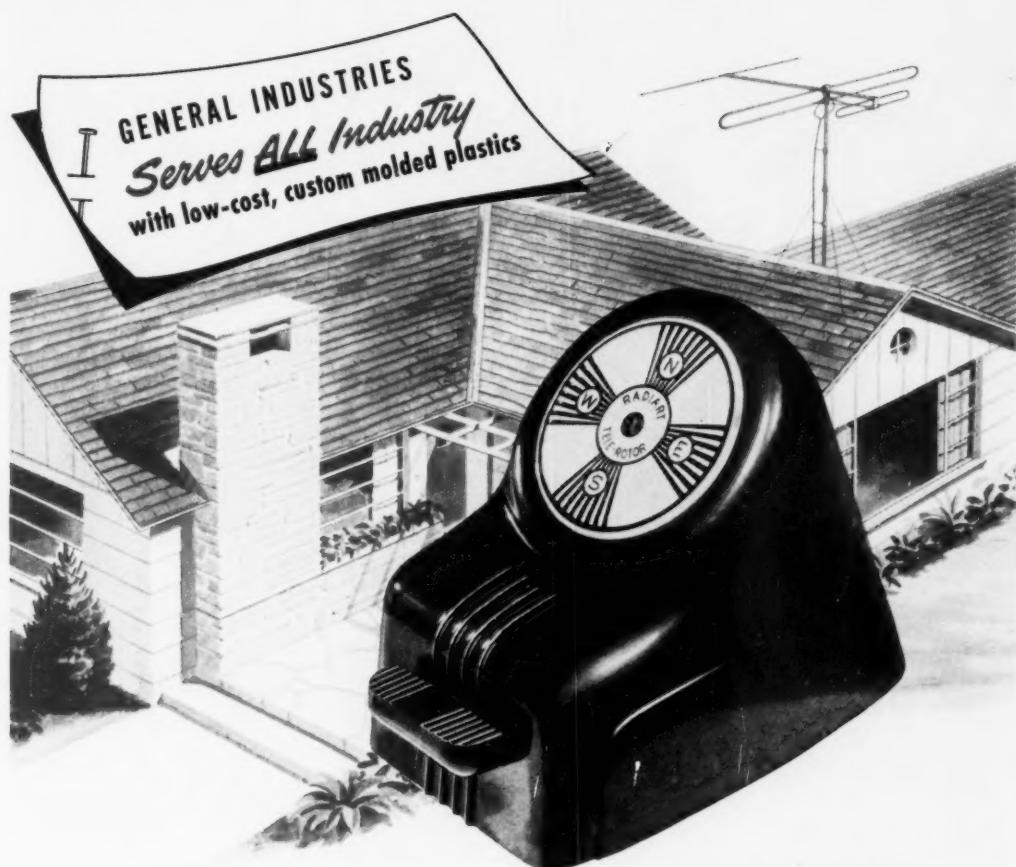
Fabricate all types of products from transparent containers and optical frames to hamper tops and shoe lace tips. Easy to blank, score, draw, sew and cement.



Plate polish after printing with new inks, dimensionally stable fluorescent colors for signs and displays.

**Celanese\*** PLASTICS

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The molded phenolic housing and knob for this Tele-Rotor television aerial control not only had to be molded *right*—they were needed *fast*.

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**STRENGTH** . . . Withstands extreme torque. No weakening stresses or strains set up by incorporating metal hub inserts in this Kys-ite Valve Wheel.



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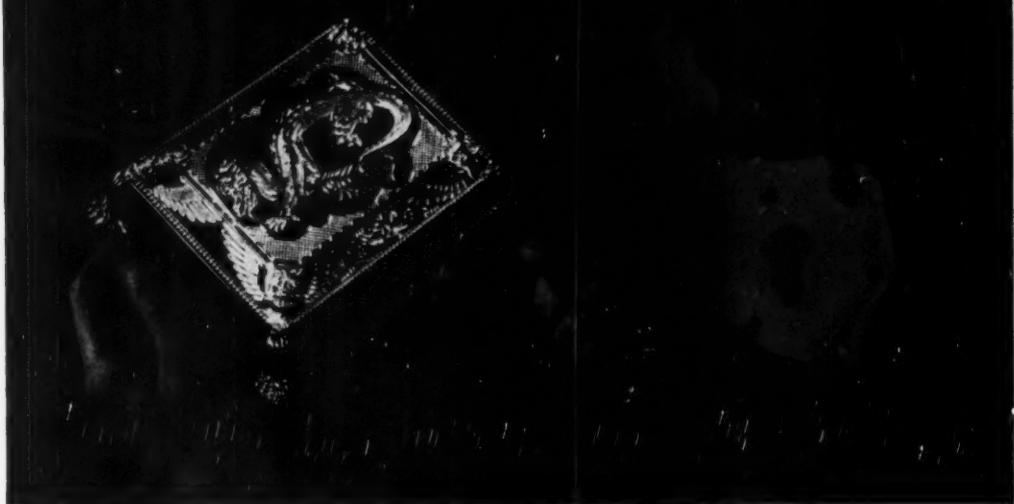
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**Modern Plastics**

# Beauty Treatment

## BY DPi HIGH VACUUM



THIS beautiful case started as just another molded plastic item.

Then it was set on a rack in a large vacuum chamber along with a gross more from the same mold. In a couple of minutes DPi high vacuum pumps had removed all but an infinitesimal fraction of the air in the chamber.

Now atoms of gold (it could have been silver, aluminum, or almost any other metal) are shot onto the lacquered plastic surface. They strike with

terrific impact because there are no air molecules to bump into and reduce their speed. They stick fast. Out in the air it goes again, for application of a second lacquer. Likewise selected by DPi coating engineers from their knowledge of the plastic and the process, it preserves precious metal beauty at dime-store prices.

High vacuum has become important at both ends of the plastics industry. Besides its role in ornamentation of

molded items, high vacuum makes possible flash distillation of plasticizing and stabilizing components of plastics that preserve elasticity and freedom from cracking.

In plastics, electronics, metallurgy, dehydration, and the ever-growing number of other fields where high vacuum is basic, DPi can bring to bear the equipment and the engineering experience that put it profitably to work for you. Inquiries are invited.

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# BAI accepts SANTICIZER 141 for use in FOOD WRAPPINGS



## proof of non-toxicity opens new business fields for synthetic plastic films

Based on the results of feeding and extraction tests extending over two years, the Bureau of Animal Industry of the United States Department of Agriculture has accepted Santicizer 141 as a plasticizer for synthetic plastic films used to package food products. This is *positive proof of the non-toxicity* of Monsanto Santicizer 141 . . . proof that Santicizer 141 is the plasticizer to use in *any application* where non-toxicity is required.

The BAI acceptance of Santicizer 141 opens new fields for the use of synthetic plastic chloride films. This suggests the use of these films in packaging meats, cheese, frozen foods, margarine and scores of other food products, sales of which are being changed by the trend to self-service.

Polyvinyl chloride film, plasticized with Santicizer 141, offers many distinct *qualities* of value to food packaging. It is tougher than most other films, hence less likely to tear. It provides excellent protection

because it heat-seals easily and securely. With Santicizer 141, it is possible to make film that is easy to print and process . . . that has excellent low-temperature flexibility.

Santicizer 141 is an excellent plasticizer for cellulosics including nitrocellulose, cellulose acetate, ethyl cellulose; various synthetic rubbers; polyvinyl acetals; and polyvinyl chloride and copolymer vinyl chloride-acetate. Look into the possibilities for expanded business that non-toxic Santicizer 141 holds for you. Complete information will be sent in response to your request by coupon or by inquiry to the nearest Monsanto Sales Office. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1707-E South Second Street, St. Louis 4, Missouri.

Santicizer Reg. U. S. Pat. Off.

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# it's hard to beat four of a kind

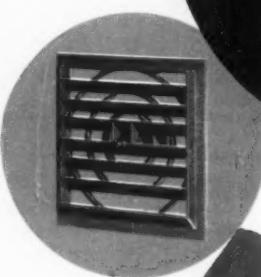


**YORKAIRE ROOM CONDITIONER**  
adds a smart style note by the clever  
use of four plastic grilles. A  
tricky molding job produced to  
close tolerances by Aico.

Yes, it's hard to beat the multiple use of identical plastic parts as a means of cutting costs. It's even harder to find a molder better qualified than American Insulator to advise on the practical use of such parts. As a pioneer in the industry, we have made it a point to keep abreast of the latest developments . . . to expand our facilities to keep pace with the constant increase in the use of plastics. Aico's complete molding service includes injection, compression, low-pressure and cold molding . . . permits Aico engineers to make an unbiased recommendation on every plastic application. So, consult Aico first . . . get the *last word* on the proper use of plastics in your products.

**AMERICAN INSULATOR CORPORATION**  
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**A single cavity**, high speed injection mold is used to produce this grille. Daily production is 2,500 pieces on a 30 second cycle. Polystyrene material is used because of its low moisture absorption and dimensional stability. Aico's "Portfolio of Plastics Application" contains many hints on the economical, practical use of Plastics. Write for your free copy today.



**MANY THINGS ARE BETTER BECAUSE OF** *Aico* **MOLDED PLASTICS**



Samsonite luggage, made by Shwayder Bros., Inc., is covered with Velon Flex and has binding molded of vinyl rather than extruded or cut from sheeting

A FEW minutes spent in any railroad station, airline terminal, or bus depot make one fact crystal-clear: Plastics have won their spurs in the luggage industry and are now headed for real volume.

With the U. S. population on the move as never before, luggage manufacturers enjoyed their biggest year in 1947 (figures for 1948 and 1949 are not yet available). In that year, according to the U. S. Department of Commerce, manufacturers of suitcases, briefcases, bags, trunks, and other luggage turned out products having an f.o.b. plant value of about \$130 mil-

lion, compared to \$36,591,000 in 1939.

Particularly interesting in the 1947 report is the breakdown of materials used by the industry. In that year, the value of leather hand luggage manufactured was \$24,597,000, while output of non-leather hand luggage totaled \$36,583,000. These figures indicate that leather, although it remains the industry's primary material for top quality (and top price) luggage, by no means enjoys a monopoly.

Without question, the vinyls, used alone or in combination with other materials, are today the dominant group of plastics being used in the

luggage field. They have, for example, largely supplanted the older types of pyroxylin coatings used on fabric-covered pieces. But a number of other plastics also figure prominently in modern luggage.

What desirable properties do plastics offer the luggage manufacturer? One of the best answers to this question is supplied by J. R. Hoover, vice president in charge of sales, B. F. Goodrich Chemical Co., maker of Geon vinyl resins.

"One of the features most important to luggage manufacturers in this day of mass production technique is uniformity," states Mr. Hoover. "Certain large manufacturers turn out handbags and other luggage pieces as Ford Motor Co. turns out cars, and uniformity is a 'must.' One disadvantage of leather for such an operation is its cost in preparation. Much waste is involved because cowhide, although shaped to fit the cow, was not designed to cover sofas or suitcases.

"Flexible plastic sheeting, however, can be produced continuously in sheets up to 72 in. wide, thin or thick, as required. Color, toughness, and flexibility can all be engineered . . . to suit the application."

Typical of the firms which specialize in supplying covering materials to the luggage field are such companies as Apex Coated Fabrics, Inc., Weiss & Klau Co., Phillip G.



Val-A-Pak and matching bag, made by Atlantic Products, are constructed of split cowhide with a vinyl coating to increase the durability of the leather

Whitman, Inc., and Studner-Blumenthal, Inc. In many instances, these suppliers process special fabric patterns to meet individual manufacturer's requirements. Some of them work closely with the vinyl materials in the form of sheeting or coatings on cotton and other base materials. Vinyl coatings over textile patterns give the finished luggage added sparkle and durability. In some instances, the covering material is also given a distinctive grain or pattern for improved appearance and protection.

Blackburn Products, Inc., Newark, N. J., producer of Tan-O-Lite, is a basic supplier of vinyl coated fabrics to the luggage field. Tan-O-Lite, available in a number of rich leather effects and a wide range of colors, is said to be completely flameproof, and to give years of service without cracking or peeling.

Blackburn uses Marvinol vinyl chloride resins in formulating its coatings. The finished fabrics are produced by spreading organosols over the surface of sateens, drills, or broken twills. Surface finishes are applied to the coated fabric by roller-embossing machines.

A pioneer supplier of coated fabrics, Textileather Corp., Toledo, Ohio, recently announced the introduction of Mustang, a new vinyl-coated fibrous-base material for luggage and case coverings. The product is described as "substantially less expensive than conventional leathercloth," and is said to have the additional advantage of being applied exactly as is leather or pyroxylin-coated fabric, eliminating the need for any special types of vinyl adhesives or modification of working techniques.

Another relatively new cloth-



COURTESY UNITED STATES RUBBER CO.

**Deluxe carrying case for 1950 Smith-Corona portable typewriter is made of Royalite sheet material**

**Pyroxylin coating on Lenox tweed fabric gives additional sparkle and protection to Airess luggage produced by Platt Luggage Co.**



vinyl combination of interest to luggage manufacturers is Fabrilite, a supported plastic sheeting recently introduced by the Fabrics Div., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Whereas conventional coated fabrics consist of a relatively heavy layer of cloth with a thin coating of plastic, in Fabrilite this relationship is reversed. The material is reported to have definite advantages in sewing, padding, and pasting without padding, saving the luggage maker considerable time in fabrication. One of the first luggage firms to utilize Fabrilite in production is Platt Luggage Co., Chicago.

No reference to the use of vinyls

in the luggage field would be complete without citing the tremendous program set up by Shwayder Bros., Inc., Denver, Colo., producer of Samsonite luggage. This company in 1948 reportedly was making one out of every nine pieces of luggage manufactured in the U. S. and had set its sights even higher.

#### Selling Plastics' Advantages

Joel D. Rosenblum, director of advertising and sales promotion for Shwayder, reports that while engineering played a large part in the successful adoption of plastics in the Samsonite line, there were also selling problems to overcome at the outset. The real solution, he states, was the company's insistence that plastic coverings are not a substitute for leather or fabric, but are durable, versatile materials with important advantages of their own.

The current Samsonite line uses Firestone Velon Flex vinyl chloride sheeting as an outer covering, in combination with molded bindings

of the same material. When the new vinyl coverings were introduced, buyer response was instantaneous. In a luggage market which had already begun to lose some of its war-born bloom, sales of Samsonite luggage continued to climb.

The Samsonite basic box includes a wooden frame and plywood sides. After the box is assembled by using polyvinyl acetate room-temperature setting adhesives, it is cut in half and the two halves kept together to achieve a perfect match.

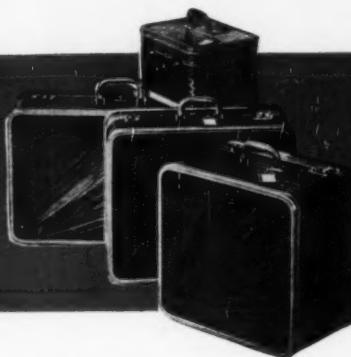
The Velon covering is then laminated onto the two halves of the box. Purchased as a printed sheeting, the vinyl material is processed through a press-polishing operation to obtain the desired surface protection and finish.

Until last year, Shwayder's bindings presented a perplexing problem. It was the part of the case which took the most knocks, and the company used top grain chrome

#### Advantages of Plastics to Luggage Makers

- 1) Water and chemical resistance, which means easy and thorough washability.
- 2) Mildew resistance—an outstanding advantage over natural leather.
- 3) Wearability, including toughness and high resistance to abrasion.
- 4) Color and a variety of decorative possibilities.
- 5) Uniformity because of controlled chemical and mechanical production operations.
- 6) Relatively low, stable material costs.

**Screen star Carmen Miranda returns from 25,000-mile tour with her almost indestructible Koch luggage made of Fiberglas mat reinforced polyester resin**



Amelia Earhart Luggage is molded of phenolic resin bonded plywood

Long-wearing two-suiter has outer covering of vinyl coated fabric



tanned cowhide bindings until January, 1949, when the changeover to molded vinyl bindings took place, making Samsonite a completely plastic-covered case.

The Samsonite bindings are molded on three 22-oz. Impco injection presses in the Denver plant. Molds are of four-cavity construction, providing a complete set of bindings for one case on each one-minute molding cycle. To provide moldings for the different sized cases, five sets of molds are used.

Specially constructed sewing machines sew directly through the wood box to fasten the bindings in place. Final operation is attachment of the hardware.

Shwayder engineers are constantly searching for new ways to improve their line through intelligent use of plastics. An example is a new type of train case which recently left the design department to go into production. This small case, intended primarily for carrying cosmetics, required a waterproof lining; so a 0.005-in. vinyl film, embossed to simulate the appearance of a faille fabric, was specified. The lining is sewn and gathered in exactly the same manner as the

rayon linings used for other cases. Injection-molded polystyrene was chosen for a small tray to be used in this case. The trays are produced in two-cavity dies on the same presses Shwayder uses to mold vinyl bindings.

#### Leading Advocate

H. G. Kates of the Fulton Leather Goods Co., New York City, has been a leading advocate of the proper use of plastics in the luggage field. His company's most ambitious step in this direction is its recently introduced line of Kalistron luggage, in which this specially processed Vinylite sheet material, is used as the outer covering.

One matched set offered by Fulton, in several attractive color combinations, includes a hat box, a 21-

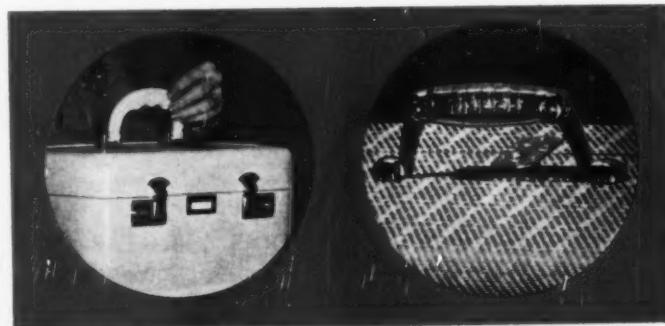
remover (acetone) shows no effect on the material.

Atlantic Products Corp., Trenton, N. J., recently began to use Kalistron for its Lady Val-A-Pak and some styles of soft-sided sports luggage. Offered in an attractive cherry red shade, the material is used with a fiber backing.

#### Vinyl on Leather

Somewhat unusual in the luggage field is this company's Vinyl-Hide material, also employed on some Val-A-Paks and soft-sided pieces. It consists of a vinyl coating applied to split cowhide, imparting improved appearance, greater toughness and scratch resistance, and increased water repellency.

Atlantic also makes wide use of vinyl sheeting as a trim material,



Atlantic golf bag has vinyl binding and trim, molded butyrate bottom



Crown Luggage Co. uses molded polyethylene handle (left) and vinyl covering. Unusual handle (right) used by Wheary, Inc. combines metal with styrene

in case, and a large train case. In its informative labels for this line of luggage, the manufacturer describes Kalistron as "the new miracle plastic" and states that it is washable, scratch-proof, color fast, mold-proof, water-proof, acid-resistant, spot-proof, mildew-proof.

The special feature of the 23-gage vinyl film used by Fulton is that the color is fused to the underside of a transparent sheet and protected on the back by a suede-like surface. The Kalistron process, known as "Blanchardizing," is said to impart unusual depth of color and superior abrasive and spot-resisting characteristics, since the color is protected by the transparent layer of vinyl. Even nail polish

as in the Parhyde trim on its well known Par golf bags. Another important plastic application on these bags is the sturdy Tenite II bottom, molded by L. & M. Products Co., Chicago. This unit, which has exceptional impact resistance and also prevents moisture from "wick"ing up into the fabric body of the bag, is sewn directly in place.

Crown Luggage Co., Baltimore, Md., is another large-scale vinyl user. This manufacturer employs vinyl coverings throughout its broad Plasti-Hide line of luggage. On some pieces, Crown uses Naugahyde vinyl sheeting made by U. S. Rubber Co., Naugatuck, Conn., with satin as a backing material. The 50-gage vinyl binding used by



**Colorguard luggage made by American Luggage Works, Inc. is covered with two-tone basket weave cloth with Vinylite coating. Binding is extruded vinyl**

Crown is of the same material. Crown also features the Comfi-grip handle, molded of polyethylene, on its complete line. This handle, with finger grips molded to fit the hand comfortably, is supplied by National Plastics Products Co., Odenton, Md. Crown identifies Plasti-Hide to the consumer as "the tough, handsome washable plastic that wipes clean with a damp cloth."

#### **Molded Handles**

Vinyl-coated cloth, obtained from several different sources, is the choice of American Luggage Works, Inc., New York, N. Y. for its American Tourister Cologuard line, offered in Sunset Red, Dawn Grey, Horizon Blue, and Forest Green. This is a Vinylite coating, the company points out, which seals in the two-tone basket-weave grain—scuff-proof, stain-proof, abrasion-resistant, and moisture-proof, as well as rendering the covering water-proof and washable. The Cologuard line also includes extruded bindings of "Permanite" elastomeric vinyl, supplied by several sources, as well as "Palmguard" vinyl handles molded to fit the hand.

Hartmann Travelgoods Co., Racine, Wis., is another distinguished user of plastic materials, making considerable use of Koroseal as a covering for ladies' luggage and also employing vinyl as binding.

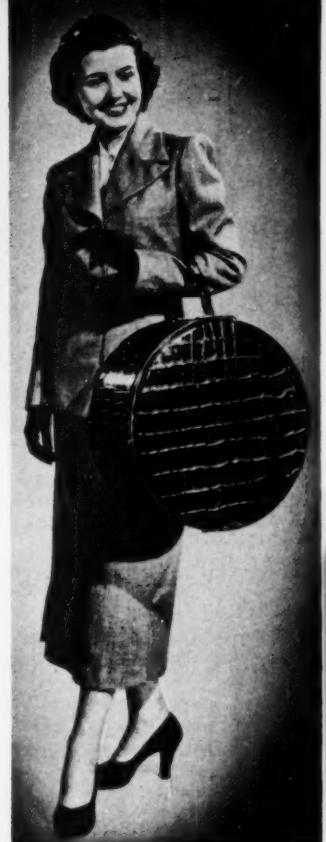
In its train cases, Wheary, Inc., Racine, Wis., uses 0.0075 clear-cast cellulose acetate sheet as a protective covering over the Celanese fabric lining. This enables the company to offer matching linings for

the cases, yet keep them impervious to soil and spilled liquids. In the same pieces, Wheary uses bottle loops of 1 1/4 in. clear vinyl belting made by Plymouth Rubber Co., Inc., Canton, Mass.

In the low-priced luggage field and particularly for such pieces as sample cases, vulcanized fiberboard continues to enjoy wide usage. The durability of this type of luggage was borne out in a series of service tests recently conducted by the National Bureau of Standards, including handle fatigue test, static load, divided-table drop test, puncture test and revolving drum test. A summary of test results showed that the vulcanized fiberboard cases received the highest all-over rating, followed by plastic-covered luggage, fabric-covered pieces, leather-covered luggage, and chipboard.

Among the newer types of plastic materials invading the luggage field are woven saran (vinylidene chloride) monofilaments, glass fiber-polyester laminates, and thermoplastic copolymer sheeting. Although none of these materials bulk large at present from the standpoint of luggage volume, each has qualities which recommend it highly for this type of application.

K. Kaufman & Co., Newark, N. J., is among the manufacturers producing a line of luggage with woven saran covering. The covering material used by Kaufman is Lumite, woven by the Lumite Div., Chicopee Mfg. Co., New York, N. Y. One ensemble is the recently introduced "Triolon" line of light-weight luggage, in which the plastic material



COURTESY BAKELITE DIV.

**Leather-like hatboxes by Droutman Mfg. Co. have Vinylite coverings**

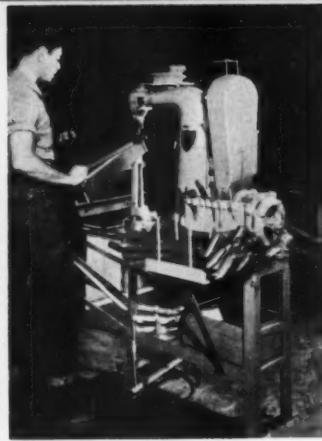


COURTESY BAKELITE DIV.

**Two-tone pieces by Fulton Leather Goods Co. are Kalistron covered**



PHOTOS COURTESY SHWAYER BROS., INC.



Vinyl bindings for Samsonite luggage are injection molded in 4-cavity die on 22-oz. machine (left). Bindings are sewn directly to the wooden box (right)

is employed for its beauty, strength, and style. Stainproof, long-lasting and virtually abuse-proof, the covering is serviceable and beautiful.

Phenolics show up in the plywood bags produced by Amelia Earhart Luggage, Newark, N. J., where the resin is used to bond the plies together. These bags, with fine, hardwood surfaces, are molded to shape, eliminating corner joints.

With the important strides made during and since the war in reinforced plastics molding materials and methods, it is not surprising to find that one large West Coast manufacturer has brought out a complete line of luggage combining glass fiber mat and polyester resins. Made by H. Koch & Sons, San Francisco, Calif., the Fiberglas luggage line includes five pieces, ranging from a 14-in. cosmetic case to a 25-in. two-suiter model for men.

Koch recommends its "Airliner"

luggage as "the only hand luggage that is checkable without a cover." Because of the sturdy construction and physical properties of the glass fiber laminate, the luggage will not scratch, dent, scuff, or mildew. Lighter than aluminum, it is advertised as the strongest hand luggage made. In shipping tests conducted under auspices of the American Assn. of Baggage Traffic Managers, a sample of the luggage was checked through from California to the East Coast, routed to receive maximum handling on the way. The case arrived at Virginia Beach, Va., without damage, and the few blurs resulting from handling were removed readily with steel wool.

The Koch luggage cases are molded in the company's San Rafael, Calif., plant, using Owens-Corning Fiberglas mat M-503 and Paraplex polyester resin from the Resinous Products Div., Rohm &

Triolon luggage made by K. Kaufman & Co. is covered with Lumite woven saran fabric. The covering is colorful, stain-proof, and extremely long wearing

COURTESY LUMITE DIV., CHICOOPEE MFG. CORP.



Haas Co., Philadelphia, Pa. Halves of the case are made in metal female molds used in conjunction with a rubber force plug. A tight fit between the halves is obtained by means of a rigid vinyl extrusion for trim, using a tongue and groove combination. This extrusion, as well as the butyrate handles, is produced by American Molding Co., San Francisco.

The unusual strength of this luggage derives both from the nature of the laminate and the horizontally ribbed design.

At least one large luggage firm is understood to be working on a line of luggage drawformed of U. S. Rubber Co.'s new Royalite thermoplastic sheet material. Indications are that luggage taking advantage of this material's toughness, surface patterns, and inherent color will begin reaching the market this year.

#### Luggage Specialties

Meanwhile, a number of luggage "specialties" made of Royalite are already in production. One of the most notable is the new Revere movie projector case made by Regal Plastic Co., Kansas City, Mo. (MODERN PLASTICS, January, 1950, p. 133). The Regal firm is also using Royalite in making such units as medical kits. Because of the material's ease of forming such kits may be formed with integral compartments, removable trays, etc., to hold medical instruments.

Another outstanding luggage specialty in Royalite is the carrying case for the 1950 Smith-Corona portable typewriter, molded in two sections and finished with a non-corrosive aluminum molding. Royalite was chosen for this unit, according to Smith-Corona, because of its rich appearance, great strength, and light weight.

Smith-Corona designed a special steel fitting for this case to which the typewriter may be securely attached; this locks into the bottom of the case without special brackets or fixtures. When the typewriter and its fitting are removed, the case becomes a compact overnight bag. U. S. Rubber Co. produces the shells for the case at its Chicago plant and also applies the aluminum molding. The piano-type hinge and molded plastic handle are installed by Smith-Corona.

# Vinyl Hose in Auto Plant

**B**EFORE the substitution of vinyl hose in industrial plants, rubber hose lines for welding, soldering, and other equipment occupied considerable space. But, with the development of a plastic hose by General Motors of Canada, Ltd., space was saved, worker effort was reduced, and the new hose lasted far longer than the old.

One great asset of the vinyl hose is its greater flexibility and smaller size. Various uses in the GM automobile plant serve to illustrate these advantages. The smooth interior finish of the vinyl hose permits faster delivery of liquids, and, therefore, allows use of proportionally smaller hose. Thus, for example, the formerly confused maze of rubber hoses which carried coolant between the welding generator and equipment has been simplified by changing to vinyl hose.

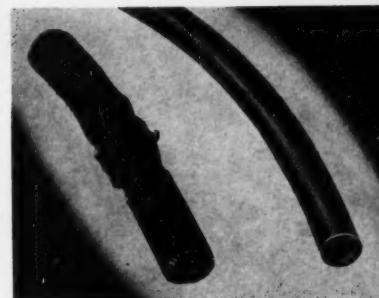
Similarly, hose size on pneumatic impact wrenches was almost halved when the  $\frac{1}{2}$ -in. i.d. rubber hose was replaced by plastic hose  $\frac{9}{32}$  in. in diameter.

Lighter weight has made the vinyl hose more satisfactory than rubber when used as air lines on portable tools. Plant personnel have found this to be true also on their solder-

ing equipment where vinyl hose is used to carry propane gas.

Because vinyl is impervious to oil, it has been possible to install automatic oilers on pneumatic tools, thus eliminating manual lubrication.

Coupled with these advantages is vinyl hose's money-saving feature. It lasts four to five times as long as rubber hose—yet costs only about half as much.



ALL PHOTOS COURTESY GENERAL MOTORS CORP.

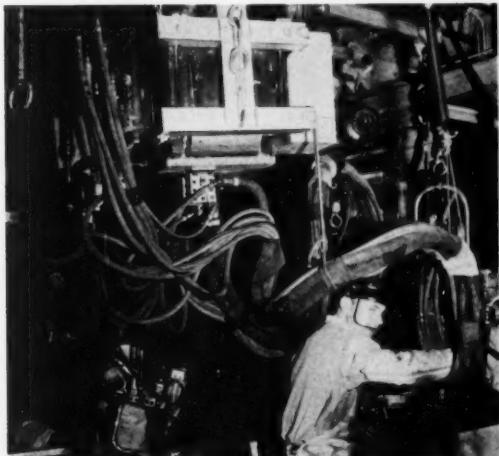
After wear test, vinyl hose, right, is good as new—rubber hose ruined

Hose size for pneumatic impact wrenches was cut from  $\frac{1}{2}$ -in. i.d. to  $\frac{9}{32}$  in. when plastic replaced rubber

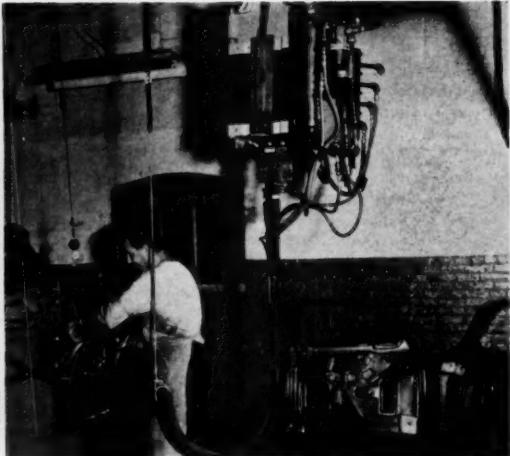
Light weight of vinyl hose is aid to portable soldering unit



Maze of rubber hose running between a welding generator and the welding equipment prior to the introduction of vinyl hose



After substitution of vinyl hose for rubber, network of connections on welding machine is more compact and much simpler



# MEASURING H<sub>b</sub>



Scale engraved on plastic case gives results of hemoglobin tests

THE concentration of hemoglobin in the blood varies, and it is often important to a doctor's diagnosis to determine the hemoglobin content of a patient's blood. The Spencer Hb-Meter, made by American Optical Co., Instrument Div., Buffalo, N. Y., was developed to give physicians a method of making hemoglobin determinations conveniently and accurately in less than three minutes.

The Spencer Hb-Meter utilizes the principle of a photometer and operates by matching the color intensity of a split field. Light coming to one side of the field passes through a sample of hemolyzed

blood; light coming to the other side passes through a wedge having permanent absorption characteristics. The physician moves a lever which moves the wedge until the fields are matched in color intensity. The results are read directly on a scale engraved on the housing of the meter.

The Hb-Meter has its own built-in light source operated by batteries for bedside use or by house current through a transformer which is available as an accessory. The meter is pocket size, and a vest pocket accessory case carries all the supplies needed to complete 25 determinations.

#### Acrylic Used

The necessity of insulating the electrical system of the meter from the case, and the need for a material which would resist laboratory

reagents, led to the choice of plastic for the case of the Hb-Meter. After experimenting with various materials, the manufacturer chose Lucite acrylic for the two halves of the meter case, the light button, the plug receptacle shell, the female plug on the cord, and the two halves of the accessory case. Because compression molds had been made before the final material choice was made, these parts are being compression molded.

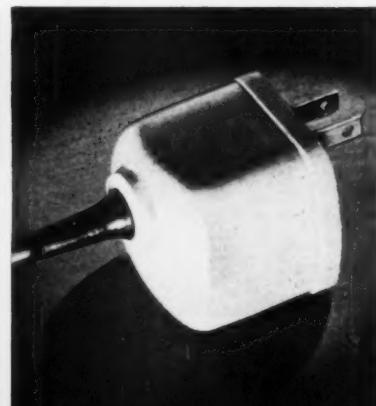
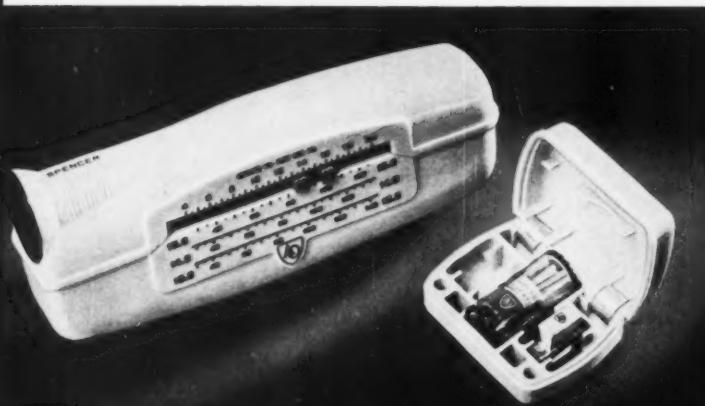
The transformer which is used to adapt the meter for operation on house current has a two-part case molded of rag-filled Melmac.

The Hb-Meter comes in a convenient carrying case fabricated of clear vinyl film.

All molded plastic parts used in the Hb-Meter are made in the American Optical Co. plant at Southbridge, Mass.

Acrylic halves of hemoglobin meter housing serve to insulate the electrical system. Accessory case, also of acrylic, holds supplies for 25 determinations

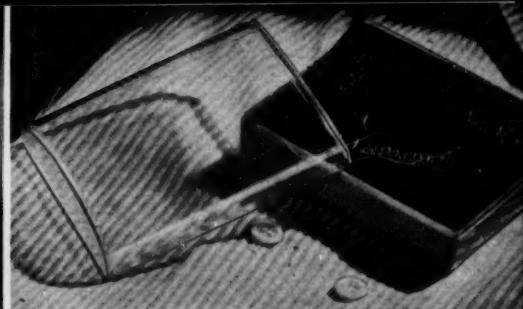
Transformer is housed in two-part case molded of rag-filled melamine





COURTESY MORTANTO CHEMICAL CO.

Originally designed for children's jewelry, the "Pee Wee" has the novel re-use value of being a small purse when the jewelry is removed. The package is molded of Lustrex transparent polystyrene for jewelers by the Bruner Ritter Co., Bridgeport, Conn. The diminutive plastic package is equipped with a small plated carrying chain and a snap lock. Polystyrene was chosen for its gleaming clear transparency and ease of molding



Creating a continued sales pull is the polystyrene package for Threadmaster, an automatic needle threader. The package is re-usable for needles, as well as being a permanent container for the needle threader. The two-piece plastic package consists of a transparent top and an opaque bottom, and is molded by Plastic Molded Arts, Inc., L. I. C., N. Y., for Eastern Seaboard Plastics, Inc., Newark, N. J.

## Double Use—Double Value

Versatility of plastics is creating impulse sales and providing the consumer with plus values in re-usable packages

**I**N today's competitive market it sometimes takes more than a good product to create sales; it often takes the added push of an eye-appealing package that will offer the user double use and hence double value.

To be ultimately successful, the value of a re-usable package must

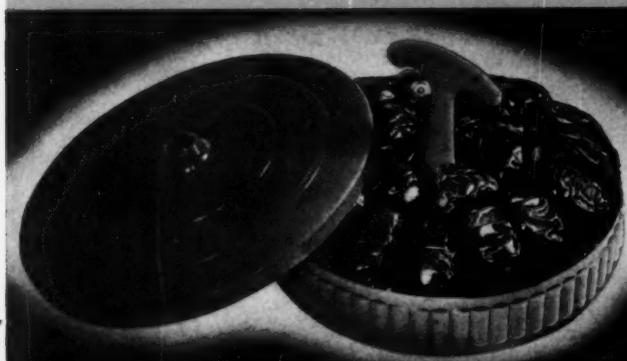
be readily apparent to the purchaser; the package must be decorative enough to create impulse sales; and it must display its advantages through color, form, and feel.

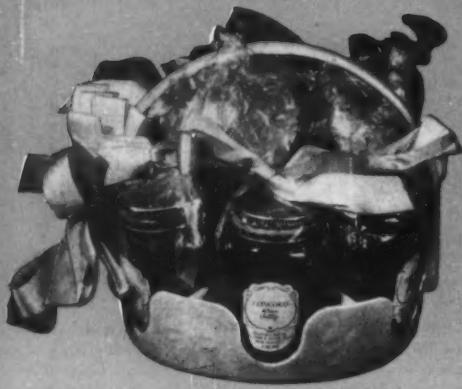
Of the many materials used for packaging today, plastics have attracted greater interest than any other type. The versatility and dura-

bility of plastics have won them wide acceptance throughout the \$5 billion packaging industry. The never-ending research on materials and the studious approach of designer, manufacturer, and end user to the proper choice of a packaging material assure continuing quality

(Continued on p. 64)

**Molded polystyrene box for dates comes with removable handle and lid.** Molded by Standard Molding Corp., Dayton, Ohio, for Arizona Dawn Gardens, Phoenix, Ariz., the container originally carries fresh dates. By pushing the handle into a small hole in the center, the container becomes a serving tray (shown at left). Container's lid can be used as a base to make a revolving server; the handle pushes through the center hole and fits into a recessed hole in the lid (shown at right). The all-polystyrene container is divided into compartments by separator strips. The container is reusable for other dates or candies. When the handle is not in place, the container can be used as covered bonbon dish





COURTESY BONSAITO CHEMICAL CO.

**Polystyrene jelly container is molded by Plastisite Corp., New York, N. Y., for Wm. A. Greco Co., Inc., New York, N. Y. Base of container has six molded-in sections and handle is removable. The basket container has re-use value as knick-knack dish, tray for glasses, etc. Sales of jelly have increased 35% since container was adopted**



COURTESY THE THOMAS A. STEEDS CO., INC.

**Designed to increase sales of polystyrene coasters is this two-piece package molded in either pastel green or yellow plastic. The package, which is molded of Koppers polystyrene by Peerless Molded Plastics, Inc., Toledo, Ohio, for The Thomas A. Steeds Co., Inc., Cleveland, Ohio, is named Jewel Box and, as the name implies, is re-usable for jewels, etc. Colors blend with the decorative schemes used in bedrooms**

improvement in the packaging field.

Today, the thermoplastics are enjoying increased usage in the packaging field, although the thermosets are still used for heavier, more decorative packages. Of the many thermoplastics, polystyrene is one of the most popular because of its low cost, ease of molding, rigidity, and wide range of brilliant colors.

Most thermoplastic containers can be made opaque, translucent, or transparent and in any desired color. One of the appeals of the transparent container to the packager is that it requires no label or other means of product identification; usually the product is wrapped and labeled, and shows through the container. The famous polystyrene

Kraft cheese package is a vivid example of this.

Plastics bring to packaging durability and permanency, ready formability, reasonable strength, and brilliant colors. As a result, they have found extensive use in reusable containers whose diversity ranges from packages for needle threaders to packages for fuses;

**Ivory-colored polystyrene is combined with transparent acrylic to form re-usable container for Thorens lighters. Molded by Hamilton Art Metal Corp., New Hyde Park, N. Y., the package has removable platform on which lighter is displayed**

**Re-usable for fishing tackle, jewelry, stamps, etc., is polystyrene box molded by Engineering Tool & Mfg. Co., Chicago, Ill., for Littlefuse, Inc., Chicago, Ill. Hinged box can be hung on wall by means of molded-in notches**

COURTESY LITTLEFUSE, INC.

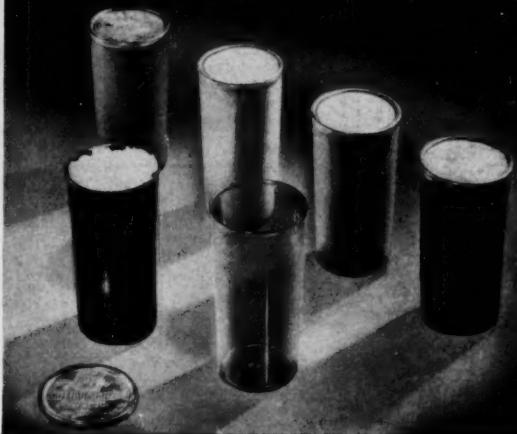
**Cigarette or jewelry box is ultimate use of this hinged and latched molded polystyrene box. The package, molded by Standard Molding Corp., Dayton, Ohio, is used as a luxury package for dates by Arizona Dawn Gardens. Tray is removable**





COURTESY TUPPER CORP.

An innovation in cheese packaging is this polyethylene container molded for Frank Ryser Co., Chicago, Ill., by Tupper Corp., Farnumsville, Mass. Originally, the container was molded and sold as a poker chip bank. It then was put to retail use as a holder for cheese packages, which were specially shaped to fit the polyethylene container. Its obvious re-use is its original use



COURTESY BOWMAN DAIRY CO.

Re-usable plastic tumblers are being used by Bowman Dairy Co., Chicago, Ill., to package cottage cheese. The tumblers, which come in six colors—ruby, topaz, emerald, amber, sapphire, and amethyst—are molded of polystyrene by Elion Mfg. Co., Los Angeles, Calif. As result of tumblers, cheese sales increased 150% on retail routes; 100% in retail stores

from packages for stamp hinges to packages for cheese; and from jewel packages to cigarette lighter cases.

The re-usable packages illustrated and described here by no means cover the entire field. They are, however, representative of the ever-increasing trend toward using plastics in packaging to provide the consumer with a plus value.

Stamp hinges are distinctively packaged in plastic. Plastic box is molded of Styron polystyrene by Parker Appliance Co., Cleveland, Ohio, for Stamp-Ad Co., Cleveland, Ohio. Box has an opaque bottom and a transparent top, which eliminates the need for permanent labeling. Instruction booklet serves as label. Box is re-usable for stamps, bobby pins, screws, etc. Two 8-cavity molds are used for box

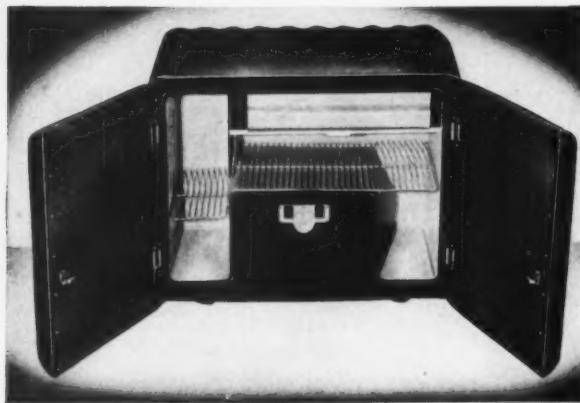


COURTESY PLASTIC MOLDED ARTS, INC.

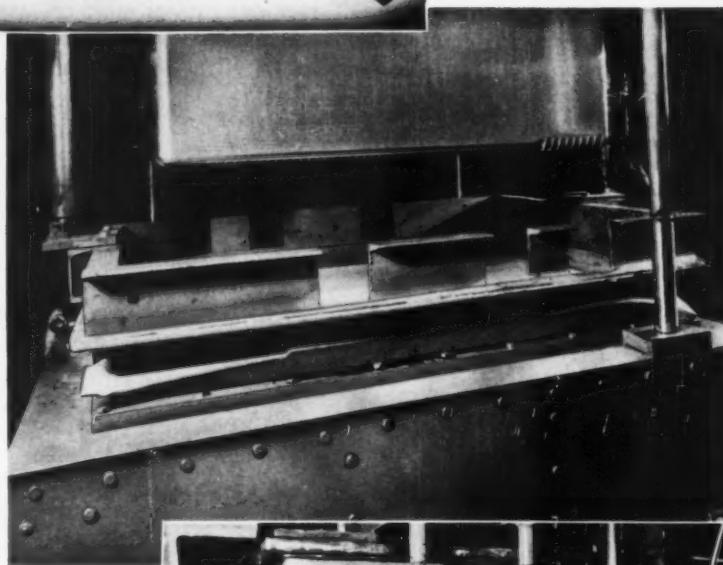
Molded plastic re-usable containers have been widely accepted by jewelry industry; they are well adapted to jewelry items which will absorb cost of box. An example is Talisman box of L. Heller & Sons, Inc., New York, N. Y., manufacturer of simulated pearls. Re-usable container is molded of polystyrene by Plastic Molded Arts, Inc., Long Island City, N. Y.



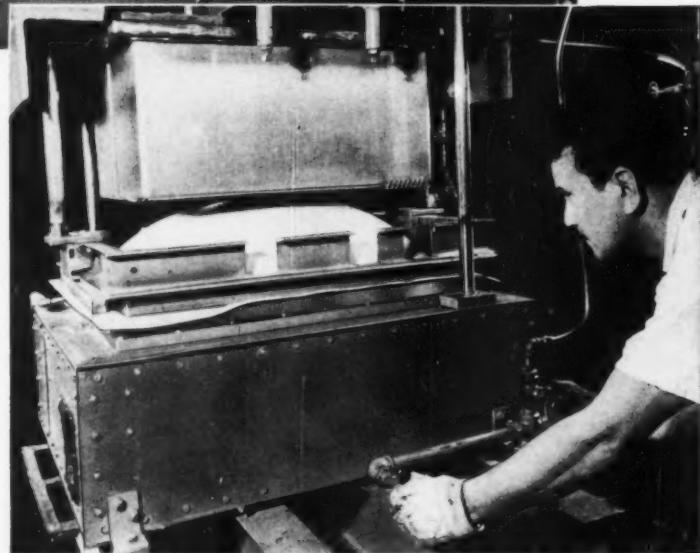
# Fabricating



Formed resin-rubber sheet, used inside refrigerator, has excellent strength characteristics plus ability to take deep draws. Interior is 31 in. wide, 19 in. deep, 25 in. high



Sheet of formable thermoplastic material, cut to size, is first heated in an oven and then clamped in place over the female mold. This step is performed by clamp ring which is operated by two pneumatic cylinders



Compressed air, admitted through the female mold, blows up the flexible sheet until the center portion touches the bottom of the male member. Mold is then fully closed

# Resin-Rubber Sheet

HERE is a resin-rubber blend on the market which, although originally produced in 1940, can still be classified as "new" because it is only now beginning to find its place in the plastics industry. This blend is produced as a formable thermoplastic sheet with excellent strength characteristics, plus the ability to take very deep draws. Two of the latest applications of this sheet material, known as Royalite, are now being fabricated by Steiner Mfg. Co., Inc., Long Island City, New York. One of these applications necessitates a draw 12 in. deep to produce a part measuring 27½ by 20 by 12 in. which forms the interior of a compact electric refrigerator made by Freez-Pak Corp., New York, N. Y. The second is a credit card invoice holder made for Texaco.

The problems in mold design, temperature control, and forming techniques for the refrigerator part required a completely new approach from that normally employed by Steiner for acrylics. It was found that the temperature of the oven as well as the time of heating had to be meticulously controlled when using Royalite. A  $\frac{3}{16}$ -in. thick sheet is used for this part. Experience has shown that the oven must be held at 275° F. and the heating time at 15 min., plus or minus no more than one minute. Over-heating will cause shrinkage in area.

The specifications for this job called for a minimum thickness of no less than 0.025 in. at any point.

Vacuum forming, snap-back—in fact practically all the forming methods well known to the acrylic fabricator—were tried with no success. At the point of deepest draw the stock either fractured or thinned out below the required minimum. As a result, the following technique was finally evolved:

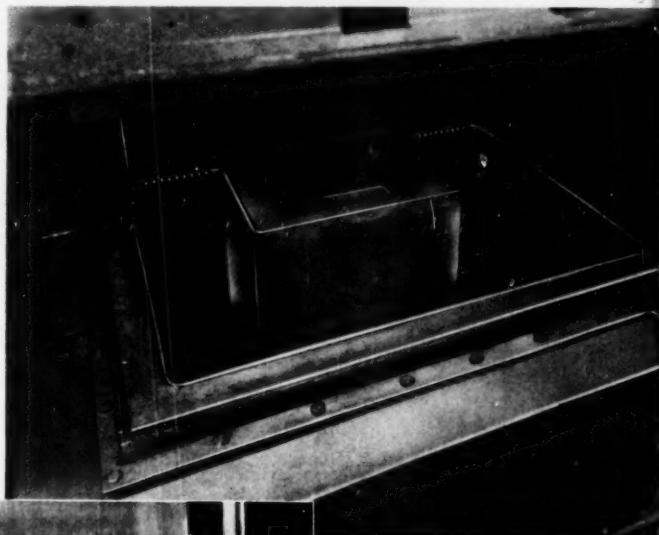
## Akin to Compression Molding

The hot sheet is securely clamped in position over the female mold by the clamp ring operated by two pneumatic cylinders. With the male mold member elevated, the sheet is blown up by compressed air admitted through the female until the sheet presses against the male. Then

the male mold member is started down, and at the same time the air pressure in the female is released and replaced by a vacuum, the male continuing to descend until the mold is completely closed. This final step is much like compression molding.

It is also necessary to control the temperature of both halves of the mold by circulating hot water. Two separate systems are required, one for each mold half and both thermostatically controlled; the male at 175° F. and the female at 150° F. Over-all cycle is 7½ min. per part.

Problems encountered in producing the invoice holder were mainly those of precise time and temperature control during the heating of the sheet. One sheet is used to form four holders at once. They are subsequently sawn apart and the necessary finishing operations and assembly of metal parts completed.

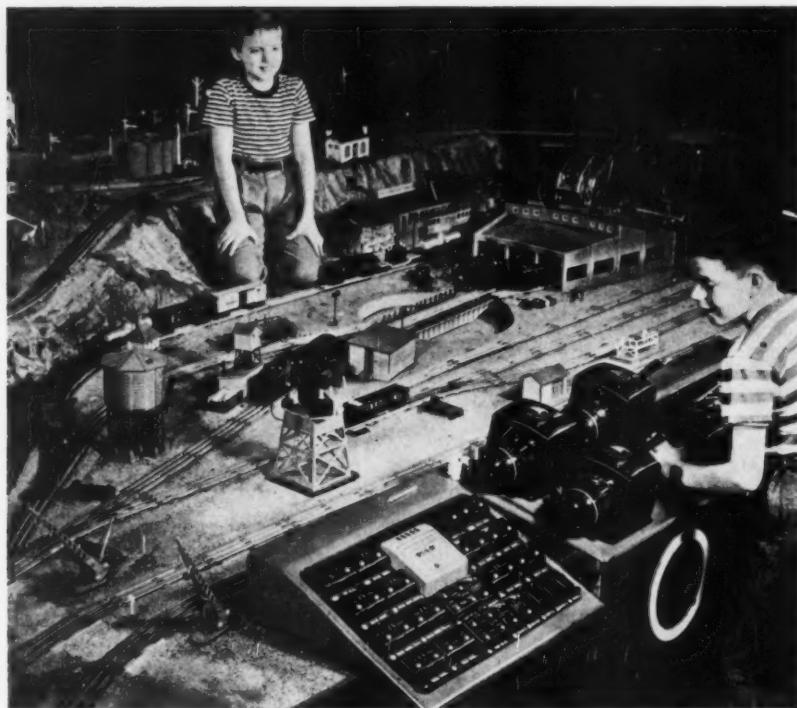


View looking down into empty female mold showing the cavity which forms sheet into the interior of the refrigerator



Close-up of flexible sheet being blown up. This operation is required because of deep draw and need for sheet to fit cavity snugly

# Phenolic in Model Train Equipment



COURTESY THE LIONEL CORP.

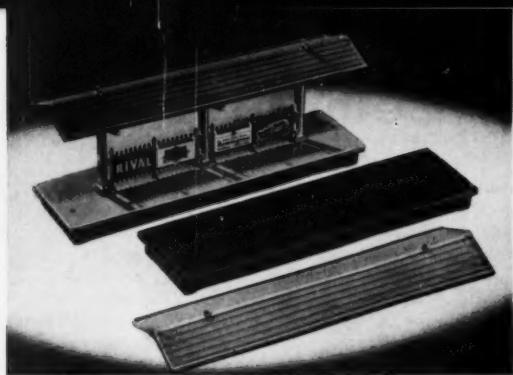
Housings for transformers, accessory controls, and switch controls for model train set-up are made of new medium high-impact phenolic molding compound

**I**N THE production of its model trains and accessories, The Lionel Corp., New York, N. Y., uses virtually all types of plastic materials.<sup>1</sup> Early in 1949, Lionel experimented with and tested a new medium high-impact phenolic molding compound, RX-421, developed by Rogers Corp., Manchester, Conn. Lionel engineers found that RX-421 stands up under the shock of trimming and riveting on a punch press; provides a firm, non-cracking grip for self-tapping screws, thus eliminating the necessity for metal inserts; has high dimensional stability; and has a smooth high sheen that meets eye-

appeal requirements for components that are visible.

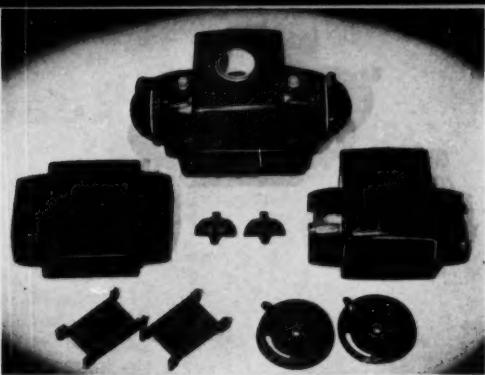
The new material is a nodular compound with a low bulk factor. It is clean, free from dust, free pouring, and readily preformed on automatic tabletting machines. Electronic pre-heating of preforms is used in most instances. Since RX-421 requires only moderate molding pressures (in the range of 4000 to 6000 p.s.i.), Lionel uses multi-cavity molds for all except the very largest of pieces. This feature, plus a rate of cure that compares favorably with general-purpose materials, assures a high production rate that is more than satisfactory with an impact material.

<sup>1</sup>See "Molding for Realism and Economy," MODERN PLASTICS 27, 162 (Jan. 1950).



PHOTOS ON THIS PAGE COURTESY ROGERS CORP.

**Phenolic station roof and base offer sturdiness and good surface finish. In front are unpainted platform and painted top**



**Complete unit and molded parts of multi-control transformer. New phenolic reduced breakage of coil form halves**

One of the most important functional components molded of RX-421 is the switch base, a section of track on which the trains are shifted from one line to another. The phenolic base serves as a bed for the metal rails and the attachment point for the electrical control mechanism. A pair of these bases—a right and a left—is molded at one time in a 150-ton press, using electronically preheated preforms.

After the part emerges from the mold and the flash is removed with emery cloth, it is placed on a punch press which rims the fastening holes and slots. The metal rails are fitted on top and crimped on by still another press.

The material previously used for this part was unable to stand up under punch-press trimming, and rejects averaged 10 percent. The new compound has reduced rejects to the order of 0.5 percent.

Another key application is the transformer housing. One complete

unit—a top and a bottom housing—is molded at one time on a 300-ton press, and flash removed in a sanding operation. These parts contain rivet holes for the nameplate, mounting screwholes, control lever openings, pilot light holes, etc. With the exception of the rivet recesses, all holes are cleaned out on a punch press.

#### Four at a Time

A slightly smaller transformer housing is also molded on a 300-ton press, but at the rate of four at a time. This part contains nameplate rivet holes as well as holes for mounting screws and riveted binding posts. These holes are also trimmed on a punch press.

A part of the ZW transformer which had suffered a high rejection rate is the coil form, consisting of two matching parts molded in a four-cavity mold on a 150-ton press and cleaned by tumbling. Broken lugs suffered during wind-

ing had previously caused the loss not only of the part but also of the wire winding and the expended labor. A substantial reduction in the cost of this coil was effected through the use of RX-421 which reduced breakage and rejections practically to the vanishing point.

#### Larger Parts

Among the larger plastic parts for which RX-421 compound is being successfully used are the base and roof for the illuminated station platform and the bases for the electric coal elevator and log loader. Field tests on these parts indicate that breakage has been almost entirely eliminated. Even where breakage does occur, the part will frequently remain usable, since it will crack but not shatter.

Altogether, some fifteen parts are now being molded by Lionel of RX-421, including several types of transformer and motor housings and cases for a number of controllers.

**Track switch bases molded of phenolic have strength needed to withstand abuse**

**Durability and good finish are incorporated in phenolic housings for such units as remote control for track switch, left, and whistle and reverse control, right**



# Ready-Cemented Tile



Polystyrene tile, made in 24 colors, adheres to any clean surface

No separate cement or mastic, and a minimum of skill, is needed to install Kwik-Tile, a polystyrene wall tile which is sold with the adhesive already applied to it. Meyer-cord Co., Chicago, Ill., developed Kwik-Tile and is producing it in 24 colors with a complete selection of trim corner pieces, and bases.

The tile comes to the customer with the adhesive protected by a paper backing sheet. The installation process consists of three simple steps: 1) soaking the tile in hot water (about 130 F.) for half a minute until the paper backing

slides off, exposing the pressure-sensitive cement; 2) wiping the water off the cement with a dry absorbent cloth; 3) applying the tile to the surface to be covered and pressing it in place firmly.

Kwik-Tile will adhere to plaster, wood, metal, wallboard, glass, or any other clean, dry, even surface.

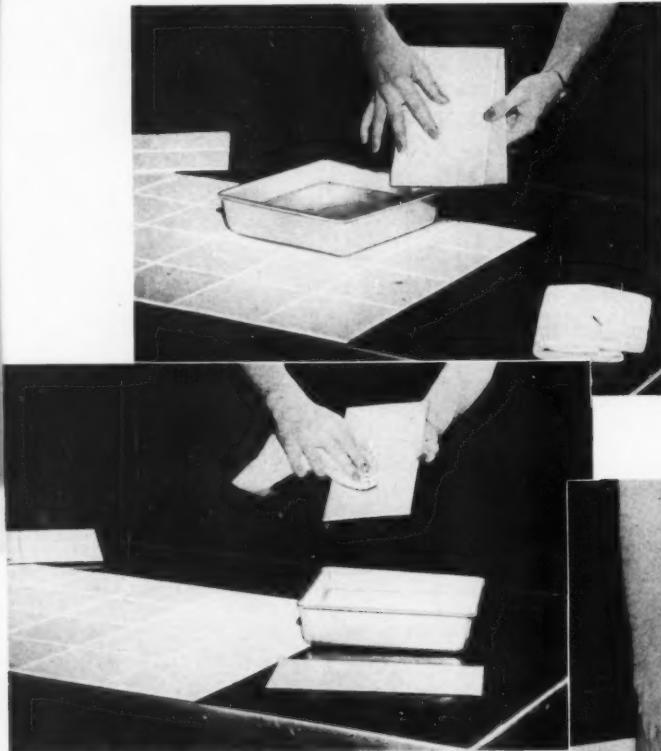
The pressure-sensitive cement used in Kwik-Tile is supplied by The Glidden Co., Cleveland, Ohio. The cement is applied to the backing sheet by roller coating. The polystyrene tiles, which are molded by A-1 Plastic Molders, Chicago, are then pressed down onto the backing sheet.

## By the Square Foot

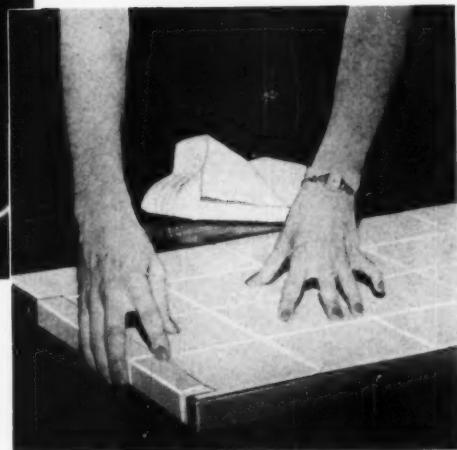
Eight 4 1/4 by 4 1/4 in. tiles are sold in a single sheet so that a square foot of tile can be set in place at one time. Many of the trim pieces, corners, and base pieces are sold with a lineal foot of tile on each sheet.

The manufacturer says that no grouting is necessary in ordinary installations. In shower stalls and other wet locations, grouting with a white waterproof mastic is advised.

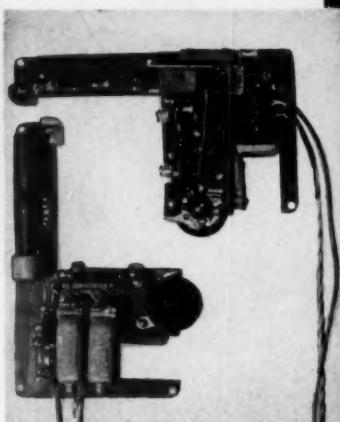
Kwik-Tile has all of the advantages of conventional polystyrene tile and, according to the manufacturer, is "20 to 50% cheaper than 'installed tile' of the same quality."



Applying the tile requires three steps. Top: Tile is first soaked in hot water until paper backing slides off, exposing pressure-sensitive cement. Above, left: Water is removed from cement with a dry absorbent cloth. Right: Tile is placed on surface to be covered and pressed firmly. Tile is also supplied for use as corner pieces and bases



Far right: Miniature radio using many plastics weighs 5 1/4 oz., resembles hearing aid. Receiver is acrylic and is connected to set by vinyl-coated wires



Left: Pocket radio case is made of cellulose acetate butyrate, measures 4 by 2 1/2 by 1 inch. Right: Component parts include units using urea, phenolic laminate, and vinyl-coated wire. Set receives on standard broadcast frequencies

## Shirt-Pocket Radio Set

PLASTICS play an important role in the Micro Pocket Radio, a precision radio receiver which weighs only 5 1/4 oz. and measures only 4 by 2 1/2 by 1 inches. The radio looks like a hearing aid and has a "speaker" like the ear piece of a hearing aid—but it receives broadcasts on the standard frequencies

of 550 to 1500 kilocycles, and is complete with on-off switch, tuning knob, and volume control.

Micro-Electronic Products, Inc., Peru, Ind., manufactures the radio which is sold exclusively by Associated Hearing Aid Distributors, Dallas, Tex.

The radio operates on power fur-

nished by one standard penlight cell A battery and one 22 1/2-volt hearing aid B battery. The A battery is said to last for 20 to 30 hr. of use and the B battery for between 60 and 80 hours.

The plastic parts in the Micro radio and the materials of which they are made are listed below.

### Plastic Components in Pocket Radio

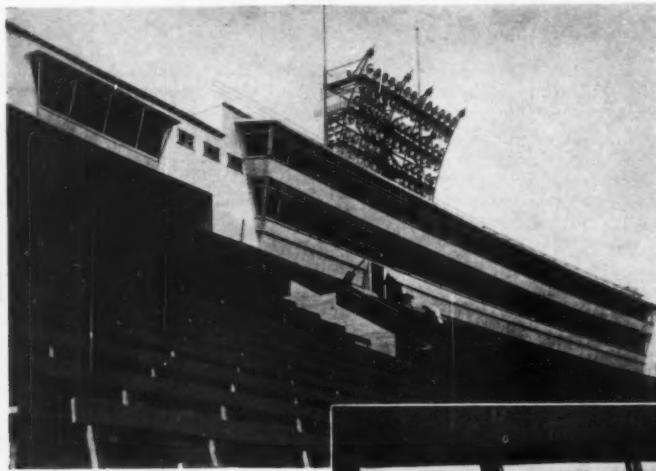
Part	Material	Supplier
Case	Tenite II, cellulose acetate butyrate	Soberite, Inc., South Bend, Ind.
Chassis	Spauldite phenolic laminate	Spaulding Fibre Co., Fort Wayne, Ind.
Sensitivity control, containing:	Model 1 Radiolum	Centralab Div., Milwaukee, Wis.
Base	Molded of Durez phenolic	Dickten & Masch Mfg. Co., Milwaukee
Knob	Molded of Plaskon urea	Midwest Molding & Mfg. Co., Chicago
Resistance element	Blanked from laminated phenolic sheet	Globe-Union, Inc., Milwaukee
Dust cover	" " " " "	" " " "
Switch cam	" " " " " made by The Richardson Co., Melrose Park, Ill.	" " " "
Coil form	Phenolic resin laminate	Mississinewa Mfg. Co., Marion, Ind.
Receiver cords	Vinyl-coated wire	The Tensolite Corp., New York
Wire in circuits	Vinyl-coated wire	Surprenant Mfg. Co., Boston, Mass.
Receiver	Lucite acrylic	Tibbets Industries, Inc., Camden, Me.

## Glazing



COURTESY HORN & MARC CO.

Sky Cabana atop Senator Hotel in Atlantic City, N.J., is enclosed in acrylic. Formability of plastic permits curved-corner glazing and custom corrugations



Windows of press box at Los Angeles Coliseum (above and right) are glazed with acrylic set at 30° angle. Light weight permits easy raising and lowering of panels. Shatter-resistant material protects press and radio personnel as well as spectators against breakage by high wind or accidental blows



**B**REAKAGE in glazing presents a constant hazard and expense in the construction and maintenance of industrial and public buildings—except when glass panes are replaced by acrylic. The difference in strength between the two materials was graphically demonstrated in a recent test: a  $\frac{1}{4}$ -lb. steel ball, dropped  $2\frac{1}{2}$  ft., broke a  $\frac{1}{4}$ -in. thick piece of plate glass, whereas a piece of Plexiglas the same thickness did not break until the ball had been dropped from 36 feet.

From this resistance to damage by impact stems a measure of added safety which is being widely recognized in the construction and renovation of schools, housing projects, and factories. Many case histories testify to acrylic's durability in glazing applications. In one housing project, window breakage was excessive in boiler and laundry buildings. It was decided to install acrylic whenever replacements were required; the subsequent reduction in breakage by youngsters—either by accident or intent—has justified the changeover.

Acrylic panes are available in either clear transparent or white translucent sheet, the latter being used because of its light-diffusion efficiency at points where merely the admission of daylight is desired.

Durability is not the sole asset of acrylic in glazing; the material is easy to handle and can be cut on an ordinary wood-working band

# with Acrylic

saw or fine-tooth saw having no set. Thin sheets can be readily broken after both sides are deeply scribed. A large file can be used to trim down edges. Acrylic panes are also easy to install, being set in the same manner as glass. Panes are usually cut shorter than glass per linear foot to allow for the difference in thermal expansion between acrylic and glass.

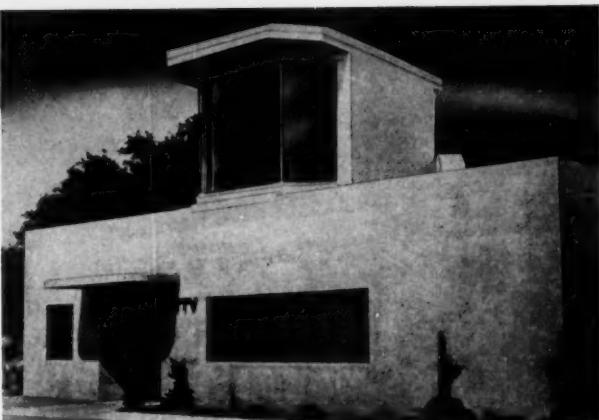
## Shaping Acrylic Panes

One of the major attributes of acrylic is the ease with which it can be shaped by heating and forming—a property which has been exploited where curved plates are required. Acrylic sheets have also proved valuable in installations such as hotel lobby windows which face large landscapes and are exposed to continuous abuse.

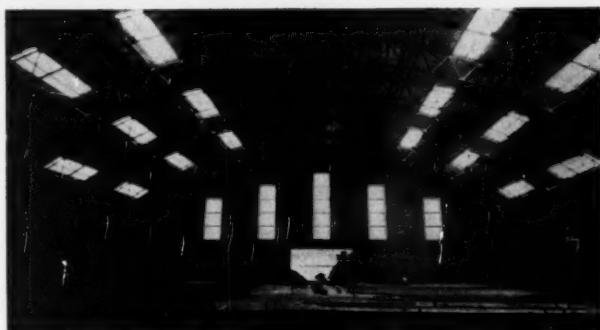
A useful form in which acrylic is available is with a corrugated surface. The uses of this type were described in the article "Letting Light In," MODERN PLASTICS, 27, 82 (Sept. 1949).

Whereas the original cost of acrylic is several times that of ordinary glass, this is more than offset, in many applications, by the savings in labor costs for replacing broken glass.

Plexiglas sheets for glazing are obtainable in thicknesses of 0.125, 0.187, and 0.250 in., and in standard sizes ranging from 12 by 18 in. up to 60 by 72 in. sheets.



Acrylic glazing in television transmitting station atop Mt. Wilson, Calif. Panels are joined by solvent welding into grooved acrylic rods



Skylighting in new University of Delaware field house uses white, translucent, acrylic corrugated to match corrugated aluminum sheathing

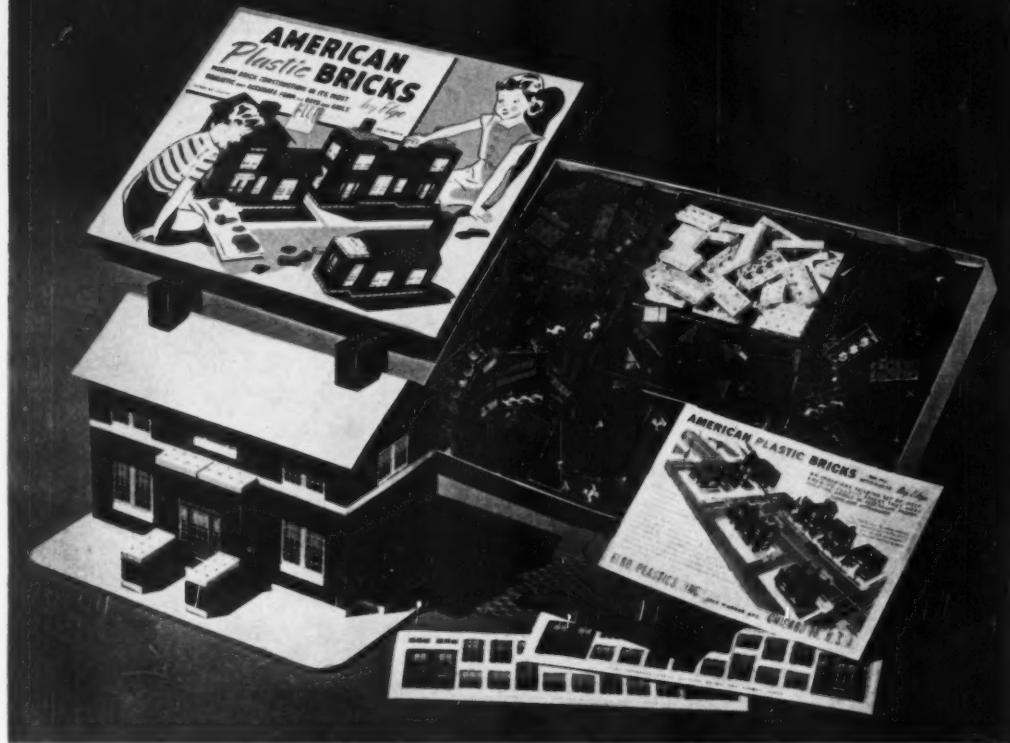


Windows in foundry extension were glazed with clear, corrugated acrylic to eliminate breakage and permit view of approaching trucks



Food plant has installed almost 400 panels of white, translucent acrylic to replace broken glass and cut future replacement costs

# Toys That Teach



American Plastic Bricks, molded of phenolic or urea, are scored to look like brick. The blocks are brick red or stone gray in color to heighten the realism. Sockets in bottom of each block fit over pegs in top of the block below.

**C**ONSTRUCTION sets must be made up of a large number of small parts which must be uniform in dimensions and economical in price. For such production, plastics are ideal. Thus, molded and/or extruded plastic parts are used in many construction toys. Three examples of this technique are shown on these pages.

The set known as American Plastic Bricks consists of just three simple shapes and sizes of blocks molded of urea or phenolic. The pieces are scored on the sides to simulate the appearance of brick. Each block has sockets in the bot-

tom which fit over pegs on the top of the block below.

The blocks, finished in brick red or stone gray, are made by Halsam Products Co., Chicago, Ill.

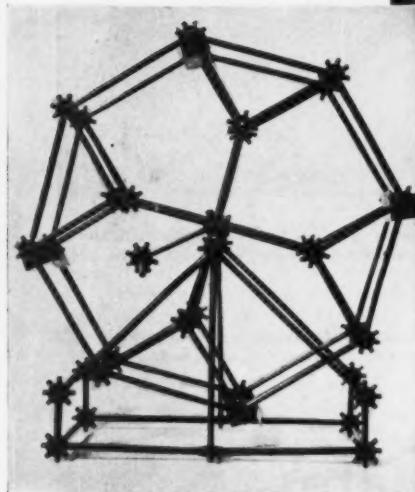
Another building construction set, known as Block City, consists of molded polystyrene blocks which are  $\frac{1}{16}$  scale models of cement building blocks. In addition to the blocks, each set contains half-blocks (for corners), doors, windows, coping pieces, and lintels—all molded of polystyrene. The blocks are hollow and are held in place by raised circular lugs on blocks below.

Block City sets are molded in

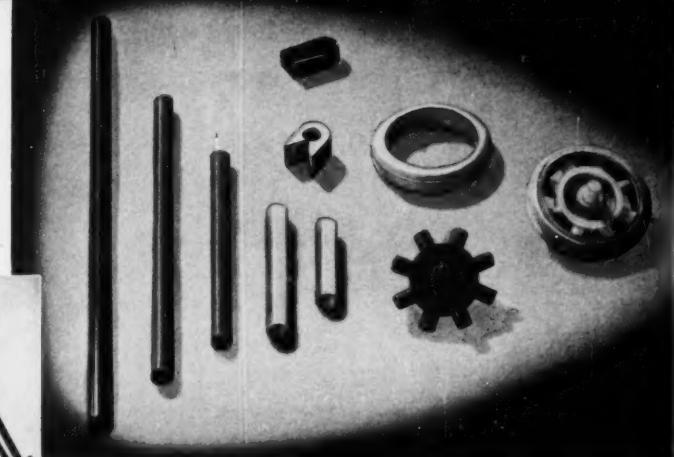
various bright colors, white, and transparent polystyrene by Tri-State Plastic Molding Co., Henderson, Ky.

The A. C. Gilbert Co., New Haven, Conn., manufacturer of the famous Erector sets, has turned to plastics for a more elementary version of that toy. The Junior Erector, as the new set is called, consists of butyrate structural members extruded by Jessall Plastics, Inc., Hartford, Conn., and polystyrene cogs molded by Gilbert. The Junior Erector can be used to build seesaws, windmills, wagons, bridges, ferris wheels, and other models.

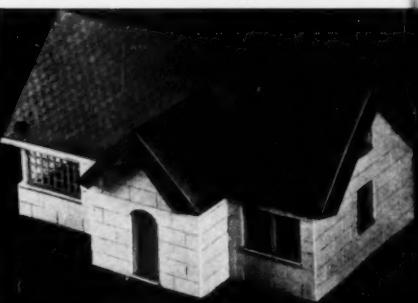
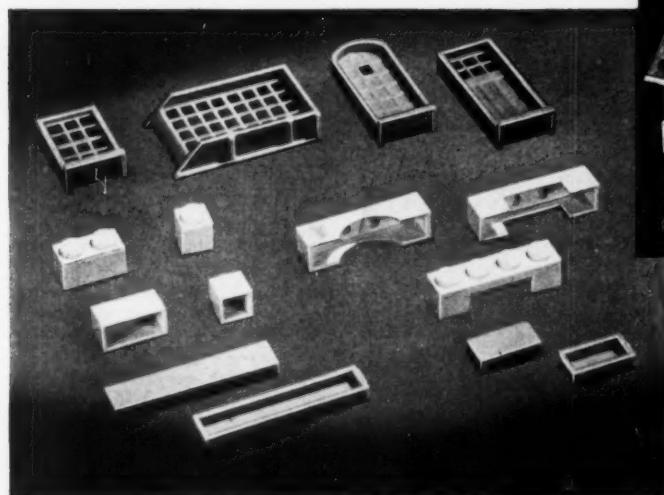
Junior Erector set consists of extruded butyrate tubes of different lengths and colors and molded polystyrene cogs. Rubber tires fit over cogs to turn them into wheels



Ferris wheel, built with large Junior Erector set, actually works

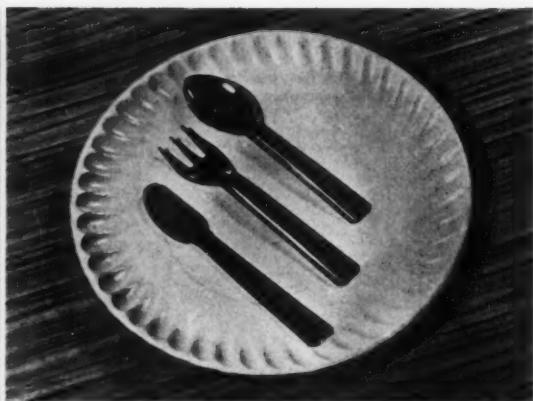
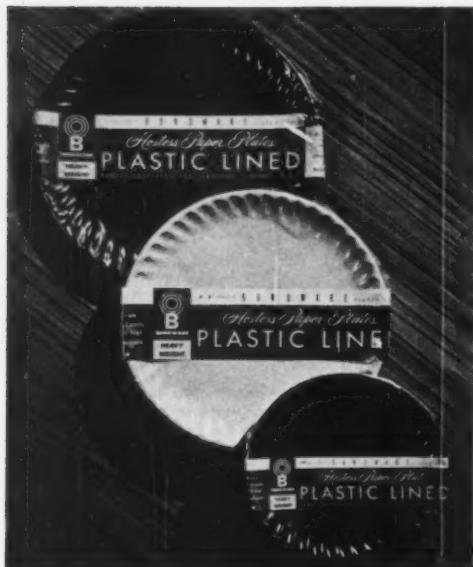


COURTESY MONSANTO CHEMICAL CO.  
Small Junior Erector set will build  
windmill and other simple models



Small house shows modern appearance of Block City set models

Block City set contains windows, corner windows, two types of doors, blocks, half blocks, door lintels, and two lengths of coping pieces. All parts are molded polystyrene



Paper-plastic plate is produced by machine coating a protective film of thermosetting material over solid manila board

Resin-coated plates are offered in chartreuse or deep burgundy shades. Three diameters available are 9 in., 8 in., and 6 inches

## Paper-Plastic Plates

**T**WO of the worst handicaps of ordinary paper plates—their tendency to soak up oily foods and inability to withstand cutting foods with a knife—have been overcome in a new type of plate combining plastic and paper. Bondware Hostess plastic-surfaced plates, developed by Bowes Industries, Inc., Chicago, Ill., utilize a protective film of heat-resistant thermosetting material over heavy-weight solid manila

board to achieve the desired result. The non-brittle coating of these plates is even impervious to damage by boiling water.

Available in three sizes—dinner plates, 9 in. in diameter; 8-in. luncheon plates; and 6-in. dessert or salad plates—the new tableware is offered in either chartreuse or deep burgundy shades. The color is in the resin coating in the surface.

In its new plastic-paper plate,

Bowes offers a coating that is not only impervious to foods but also inert, so that foods will not chemically affect the coating surface. Further, the coating is tasteless, odorless, harmless, and smooth.

The substance ultimately chosen for the coating is a combination of thermosetting materials identified by Bowes as "Impervium", which is machine coated on the paper stock prior to the plate-forming operation. In the manufacturing process, the plates are shaped in metal dies at a temperature of 450° F. The plastic coating is applied to the stock in the thinnest practicable continuous film which averages around 1 mil in thickness. Care is taken to avoid pinholes which would allow grease to seep into the board stock.

The plates are packed in clear cellophane with a descriptive band label. Although retailing at approximately twice the price of regular paper plates, repeat sales and mounting volume indicate consumer willingness to pay for the extra value. The plates have received particularly favorable receptions in institutions requiring mass feeding.



# Acetate Houses Electric Mixer

As the trend to light-weight, portable mixers for the kitchen continues, plastic housings appear to be winning an established place for themselves in this field. Newest of these devices to make its bow is the Aro Spring Whip electric mixer, manufactured by GM Laboratories, Chicago, Ill.

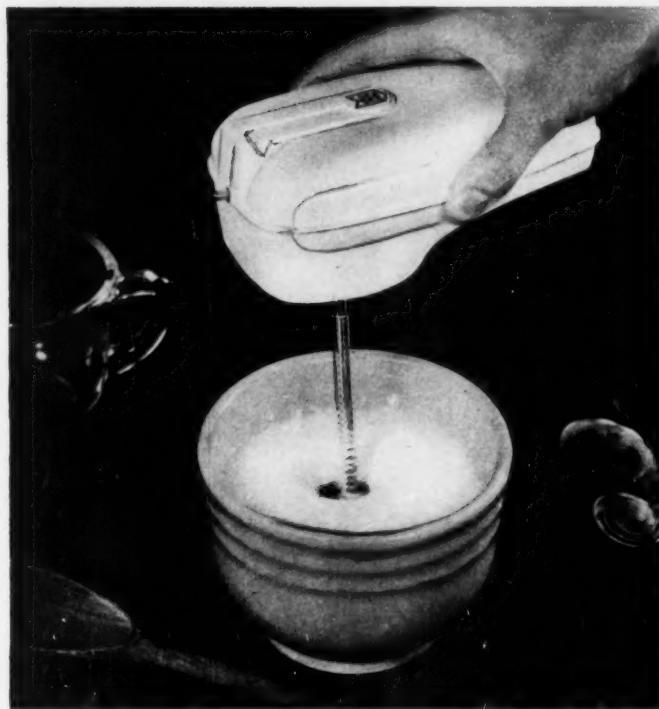
Styled by Joseph Palma of Palma-Knapp Associates, Chicago, the Aro mixer is housed in a white Lumarith XF case made by Chicago Molded Products Corp., Chicago. The case, made in two halves, is of interlocking construction, with a decorative bead around the edge of the upper section which conceals the junction between the two parts. Ample wall sections throughout, and the use of the flame-resistant acetate material, were important factors in the approval of the mixer by Underwriters' Laboratories.

Threaded inserts molded into the upper half of the housing provide anchorage for a metal plate on which the motor is mounted. A six-opening louver at the smaller end of the lower case component provides an outlet for cooling air drawn across the motor by a small fan. This feature, plus the insulating properties of the plastic housing, keeps the device comfortably cool in operation.

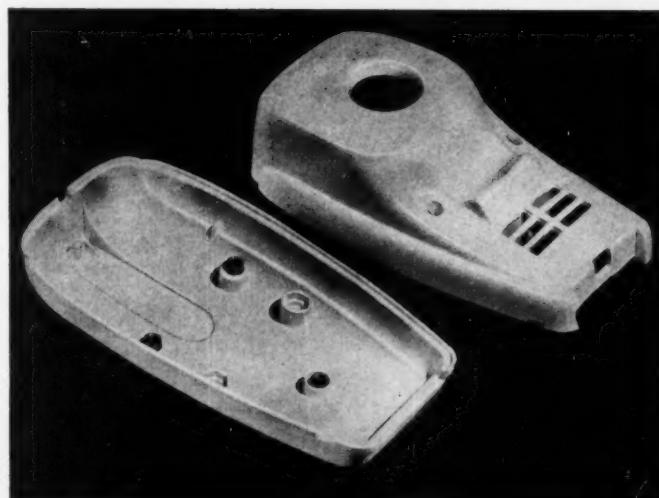
Particularly versatile in use, the Aro mixer comes equipped with a special wall bracket from which it can be easily removed if the mixer is to be used directly at the stove or elsewhere. Weighing only 2 lb., it is shaped to fit the hand comfortably and features a coil-spring type of whip which readily adapts itself to any shape of mixing container and cannot snag clothing or injure fingers.

The toggle switch, motor shaft, and other metal parts of the mixer are in sparkling chrome finish, providing a pleasing contrast to the white plastic case.

Acetate mixer case is made in two halves. Decorative bead conceals junction. Threaded inserts in upper half provide anchorage for plate on which motor is mounted



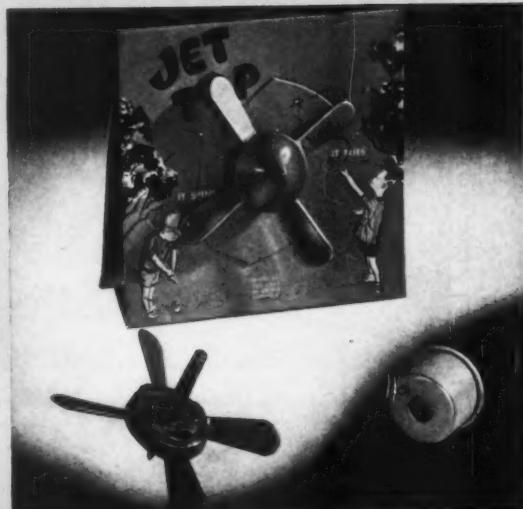
Electric mixer housed in cellulose acetate case detaches from wall bracket when used in various parts of kitchen. Case is shaped to fit hand comfortably



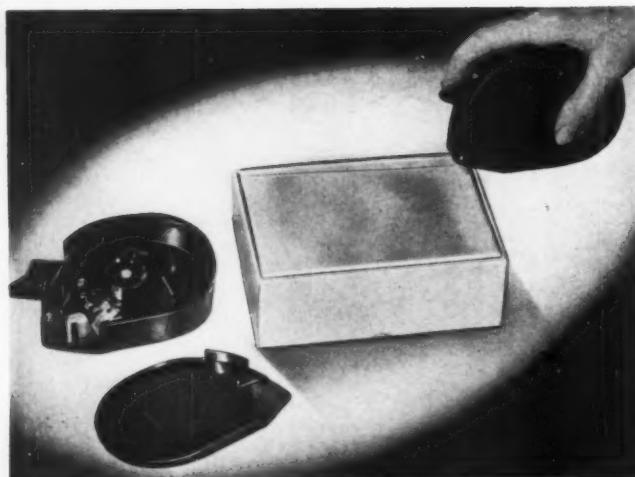
# PLASTICS PRODUCTS



Sterling flatware is packaged in polyethylene bags for protection against tarnishing and scratching. The bags are fabricated of 0.003 in. Plax-pak film by Kage Co., 130 Hartford Rd., Manchester, Conn., for R. Wallace & Sons, Wallingford, Conn. Open ends of the bags are heat sealed and imprinted in one cycle

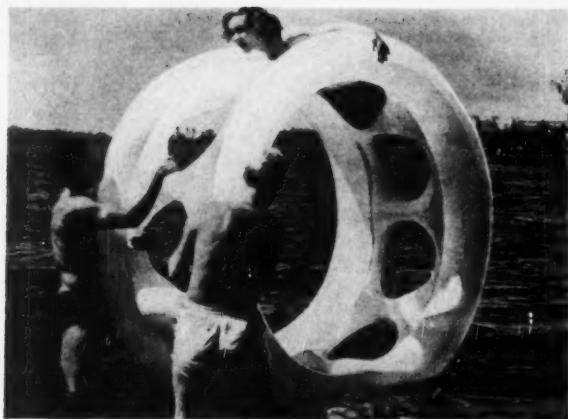


Spring-actuated Jet Top will spin for a long time if ejected downward. If ejected upward, its helicopter-like wings will carry it high into the air. The top itself and the spring block are molded of cellulose acetate which has the impact strength necessary for such a toy. Manufactured by Plastic Art Toy Co. of America, 525 Garden St., Carlstadt, N. J.

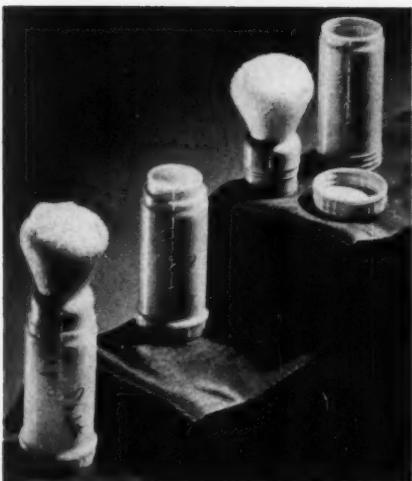


Dispenser for pressure sensitive tape has built-in cutting edge controlled by trigger on top of dispenser. Thus it is possible to apply the tape and cut off the length desired without ever touching the tape itself. The two-part housing, the roll which holds the tape, and the trigger are molded of wine, green, gray, or brown ethyl cellulose by Plasticraft Mfg. Co., 287 Laurel Ave., Arlington, N. J. Dispenser made by Tape-matic Corp., 217 Astor St., Newark, N. J.

Hanging flower pots of various types are molded of Lustrex polystyrene. Types available include plain pots with matching wall brackets in bright colors, and Chinese lantern-type set consisting of hanging pot and matching hood with molded-in Chinese characters. Trellises and other types of pots not shown are also made by Bernard Edward Co., 5252 S. Kolmar Ave., Chicago, Ill.



The Bil-Buoy, a new type of beach toy, is an inflatable water wheel 6 ft. in diameter made of Vinylite film. It can be used as a float for sun-bathing or as a base of operations in competitive water games. When deflated, it can be stowed in the corner of an automobile trunk. It can be inflated easily and weighs only about 8 pounds. The Bil-Buoy is made by Bilnor Corp., 53-06 Grand Ave., Maspeth, N. Y.



Three-piece handle of Janey Elizabeth beauty brush is designed so that it can be converted into a compact traveling unit for the purse. The handle is molded of Tenite II cellulose acetate butyrate. One section holds the bristles, the second section screws on to serve as either a handle extension or container. Third part is a screw-on cap. Rubberset Co., Ltd., Gravenhurst, Ontario, Canada



Massage brush molded in one piece of polyethylene can be used for scalp massage, for body massage, to distribute the soap through the hair during a shampoo, or can be used in place of a comb to groom the hair. The brush is virtually unbreakable, but it is light enough to float. Made by Fay's Professional Products Co., 254 W. 31 St., New York 1



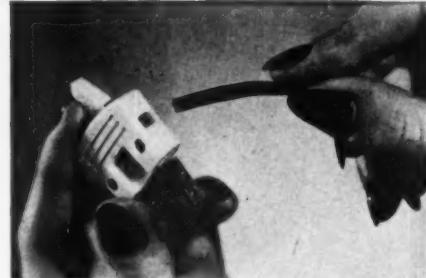


Serving trays molded of copper-colored polystyrene are given an added decorative note by a molded-in hammered effect on their top surfaces. This makes the trays look more like copper and helps hide the flow lines which often show up in objects molded of metallic polystyrene. Molded, 8 by 14 and 4 by 6 in., by The Plas-Tex Corp., 2525 Military Ave., Los Angeles, Calif.



In addition to teaching a child thrift, the Globe Bank can also teach geography. A carefully detailed relief map of the world is molded-in. Globe and pedestal are both made of Hercules cellulose acetate by Commonwealth Plastics Corp., Leominster, Mass.

Chaise lounge for outdoor use is upholstered with Lumite woven saran fabric in bright ecru and green pattern. The woven saran material resists stains, is easy to keep clean, and will withstand weather. Logan Co., 202 N. Buchanan St., Louisville, Ky., makes the chairs, using fabric produced by Lumite Div., Chicopee Mfg. Corp., 47 Worth St., New York, N. Y.

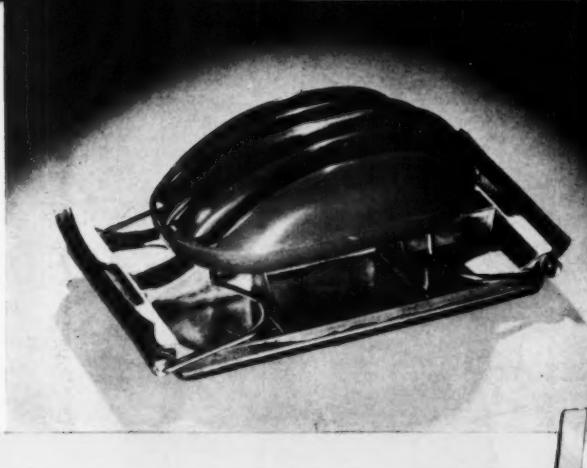


Infra-red heat applicator called Therm Massage has a curved head molded of heat-resistant Resinox phenolic. The head is molded to fit contours of the face and body. The applicator weighs only 4 oz. and uses only 6 watts of electricity. Made by Sibert & Co., Inc., 41 Rankin St., Newark, N. J.



Quick Clamp Plug can be attached to standard number 18 rubber-, plastic-, or rayon-covered parallel wires in just a few seconds. Wires are slit slightly, inserted into hole in side of plug, and connection is made by pressing lever atop the plug. The plug is molded of Plaskon urea and has Underwriters Laboratories approval. It is made by Monowatt, Inc., Providence, R.I.





# PLASTICS PRODUCTS

Red Top Sandmaster has deeply corrugated handle molded of red Styron polystyrene. The design allows greater air circulation, thus keeping heat build-up at a minimum. The 3 by 5 in. sander holds three pieces of coarse or 10 pieces of fine paper at one loading; fresh paper is ready when a used sheet is torn off. Made by Red Top Products, Plymouth, Mich.



Flat, suitcase-shaped handbag is molded of Lustrex polystyrene in black, white, pastels, and various bright colors. The bag, called the Beauty Box, is lined with colorful cotton prints. It measures 10 by 6 by 2 inches. Plastic parts are molded by Plastic Molded Arts, Inc., 12-04 44th Ave., Long Island City, N. Y., for Koret Inc., 33 E. 33 St., New York 10, N. Y.

Paper-covered scrapbooks, photograph albums, score pads, and notebooks are coated with Vinylite resins to give them a luxurious appearance and resistance to alcohol, scuffing, grease, and peeling. The various items are made in gold-embossed red, blue, brown, green, maroon, and tan by Metropolitan Records, 260 Gold St., Brooklyn, N. Y.; processed by Plastic Film Corp., Plainfield, Conn.



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# Crosshead Extrusion of Thermoplastics

Developed during the war to make wire and cable insulation, this method, coupled with multiple-screw extruders, is now producing many unusual end products

by E. G. FISHER<sup>†</sup>

THE crosshead extrusion of thermoplastics was probably the first plastic extrusion process to achieve industrial importance. It was developed by the wire and cable-making industry during the early war years when vinyl and polyethylene insulations were being experimented with as a replacement for natural rubber; a large proportion of the insulated wire made today is produced by this process.

As a result of the growing importance under peacetime conditions of the various methods of thermoplastic manipulation, the scope of the crosshead extrusion process has been greatly extended. It is the purpose of this article to give a brief description of new developments.

#### Equipment Used

The crosshead equipment normally used in the wire and cable industry is a simple adaptation of the equipment formerly used for the manufacture of rubber-insulated cables and wires. It consists of a plastics extruder, with a crosshead of conventional design fitted to the delivery end. Bare conductors, fed from reels or coils, are passed transversely through the crosshead. Plastic extrusion material of an ap-

propriate type is fed into the hopper of the extruder, and passes, in a softened state and under pressure, to the crosshead. The conductor passes through this material, and emerges from the extrusion coated with a plastic sheath. This is shown in Fig. 1.

This equipment has proved successful in the manufacture of cables, and in the vinyl and polyethylene coating of small-diameter core material. The unfavorable flow conditions, however, resulting from the 90° deviation angle of the crosshead, become increasingly troublesome with increase in dimensions of the core material, and completely preclude the use of some of the more difficult thermoplastics.

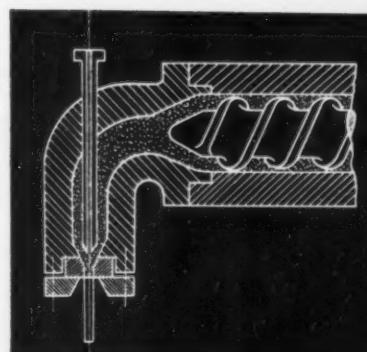
The non-uniform flow in the 90° crosshead of usual design is due primarily to the flow differential between the inner and outer radii of the flow path, and to the disturbances created by the presence of a guider tube around which the material must pass. Also, the high frictional resistance of the conventional 90° equipment retards uniform flow of stock to the die orifice.

Various designs of crosshead have been developed to overcome this non-uniformity of flow, and the most successful of these are shown in Fig. 2. It will be noticed that

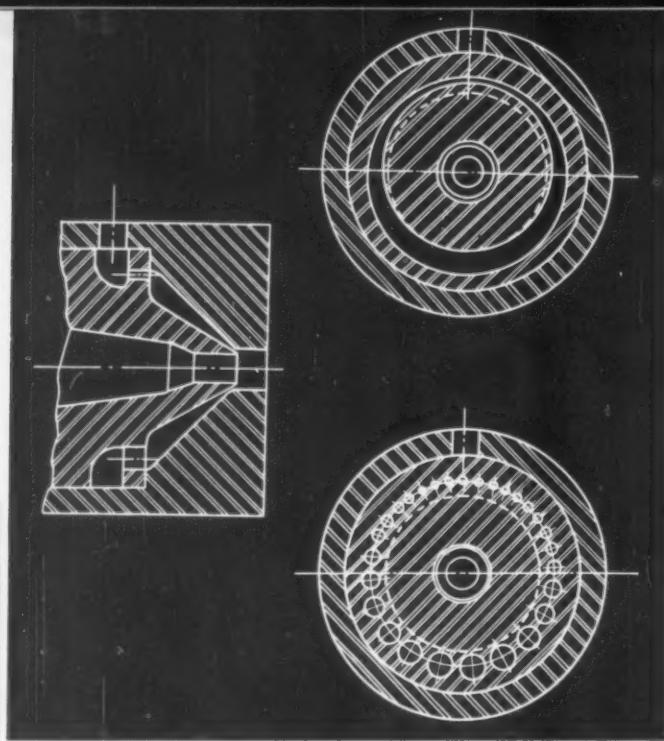
there has been a considerable departure from the normal practice, in that flow adjustment has been achieved by the use of either a correctly designed compensating breaker plate, or an off-center torpedo member. By both methods it is a simple matter to adjust the frictional resistance of the crosshead to the flow of plastics material. As an alternative to these methods, a balanced path extruding head is shown in Fig. 3.

A further departure from normal

1—Bare conductor in crosshead emerges coated with plastic sheath



<sup>†</sup>Reg. U. S. Pat. Office  
in collaboration with L.M.P., Turin, Italy.



2—Crosshead designs developed to achieve uniform flow. Adjustment is provided by use of compensating breaker plate or an off-center torpedo member

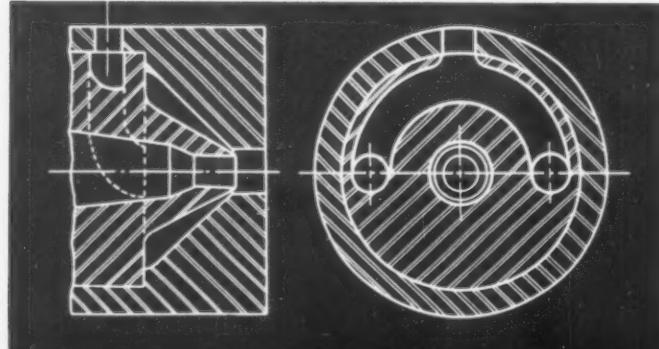
practice will be noted in these illustrations, namely, that the entire head assembly has been considerably shortened in order to reduce frictional losses to a minimum.

By the use of equipment designed on these lines, in conjunction with extruders of correct type and appropriate dimensions, the extrusion of many hitherto impossible products has been made a commercial success. One notable achievement, which is only one example from a whole range of similar items now

in daily production, is the coating of 2-in. diameter metal tubes with cellulose acetate to a thickness of 0.015 inch. It is apparent that the availability of standard equipment and technical service, to enable industrial users to carry out such work for themselves, is a great step forward for the plastics industry.

Correctly designed crosshead equipment has many interesting applications beyond the more obvious ones of coating and covering. The flow angle of the plastics ma-

3—Alternative method for overcoming non-uniformity of flow uses a balanced-path extruding head. Head assembly is shortened to reduce frictional losses



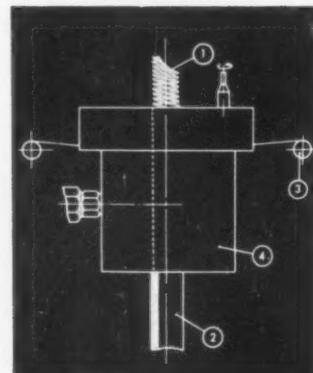
terial and the general form of the equipment enable it to be readily adapted to special work and allow the easy attachment of flow-modifying devices. The following examples illustrate these points.

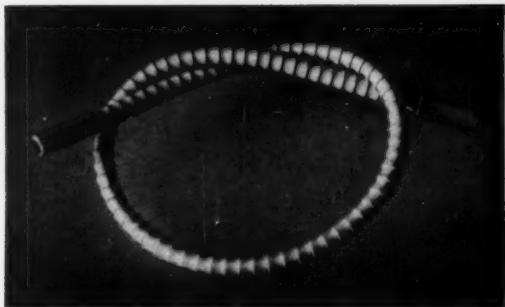
#### Non-Kink Tubing

Spiraflex tubing is a logical development from the coating technique described above. An open metal spiral (1, in Fig. 4) is passed through the crosshead, and plasticized vinyl material is fed to the extruder. The metal spiral emerges from the die orifice completely covered (2) with plastic material. The walls of the reinforced tube thus formed are further strengthened, in the same operation, by the incorporation, via the crosshead, of a number of lengthwise-disposed cotton or polyamidic monofilaments. The final product is a non-kinkable flexible tube of great strength and durability which is capable of withstanding high internal pressures without distension or elongation.

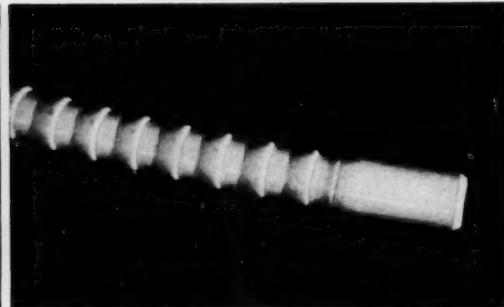
In the manufacture of Spiraflex, the metal spiral is fed by means of a separately driven gear attached to the equipment, while the monofilaments, which are held on bobbins (3 in Fig. 4), are drawn through the crosshead by the plastic material as it is extruded. The forward speed of the spiral, or the supply of plastic material to the crosshead (4) may be varied to control the type of tube produced. Moreover, by selection of the grade of thermoplastics material, the physical char-

4—Extrusion over metal spiral gives flexible tube with reinforced walls





5—Left: Crosshead attachment which controls plastic flow at regular intervals produces external nodes or reinforcement rings. 6—Right: Device can be stopped completely as desired to give plain sections to finish off tube length



acteristics of the tube can be further varied to suit different applications. By using equipment of suitable dimensions, Spiraflex tubes of all sizes are readily extruded.

#### Reinforcing Rings

Rugaflex tubes are extruded from normal plasticized vinyl compounds, and are provided with external nodes, or reinforcement rings at regular intervals as in Fig. 5. These reinforcement rings are produced by a simple attachment to the cross-head, which automatically increases and decreases the plastic flow in definite steps, thus modifying the external diameter at regular intervals. This device can be stopped completely at will to give plain sections to finish off the tube length, as in Fig. 6.

As will be appreciated from the above description, and from the illustrations, these tubes can be manufactured in any required standard length, and in a wide range of sizes and colors. The particular structure gives them great flexibility and reduced tendency to kink, combined with sufficient strength to withstand reasonable internal pressure.

Rugaflex tubes are suitable for the conveyance of town gas and compressed air: large quantities are already in use in laboratories, hospitals, factories, etc.

These examples of new extrusion techniques are produced on single extruders feeding crossheads of special design to which flow-modifying, and other devices, have been added. By using two or more extruders to feed one such crosshead, the range of products which can

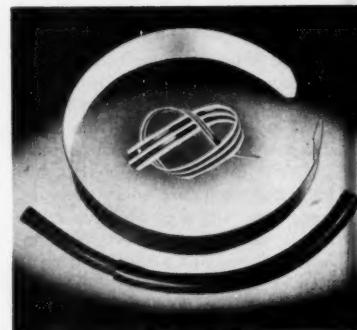
be readily manufactured is further extended. For example, thermoplastics with different physical or chemical properties can be extruded simultaneously to give composite products in which the diverse properties of the component materials can be conveniently utilized. Two-color strips and beltings (Fig. 7) are in everyday production, the colors being arranged either to give different colored facings, or in the form of lengthwise stripes. Multi-color stripe sheeting, in various plastics such as vinyl, cellulose acetate, and polyethylene is also being produced. In these cases the cross-head shown in Fig. 8 is used, the different colors being handled by separate extruders.

#### Vinyl Plus Polyethylene

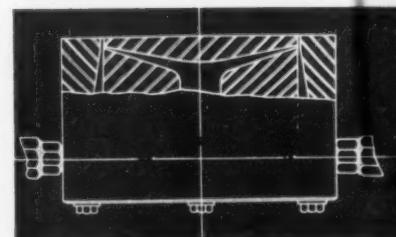
Viprene tubing, the first important example of this manufacturing technique, consists of a soft vinyl tube internally protected by a concentric polyethylene layer. With the valuable attributes of wide color range and flexibility of the vinyl plastics added to the chemical inertness and non-toxicity of the polyethylene, the resulting tube is ideal for the conveyance of corrosive chemicals, solvents, liquid foodstuffs, etc. Furthermore, greater flexibility of the tubing gives it an advantage over the semi-rigid polyethylene tubes normally used in these applications.

#### Spiral Tubing

An extrusion of slightly more complicated nature is Riflex tubing. This consists (Fig. 9) of a plasticized vinyl tubular core surrounded by, and homogeneous with, a



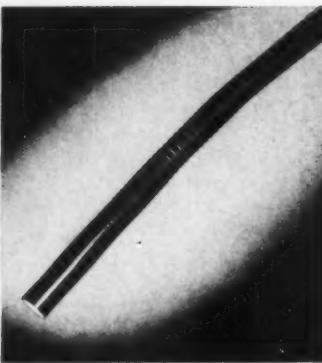
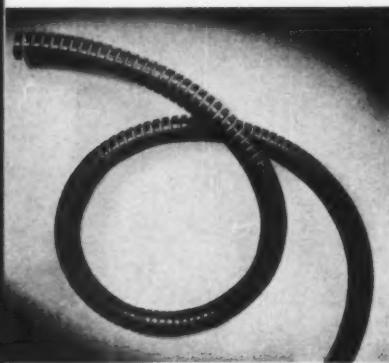
7—Tandem extruders feeding one crosshead produce two-color strips



8—Crosshead for producing multi-color stripe sheet in various plastics

spiral exterior of un-plasticized vinyl.

This combination of chemically resistant plastic materials gives a flexible tube of great strength which is capable of almost universal application. It is suitable for the conveyance of corrosive chemicals and gases under high pressure, and can



9—Left: Special crosshead fed by two extruders joins two different vinyls in spiral tube. 10—Right: Rotating knife may be stopped to give smooth finish

be used with success in vacuum applications. The high abrasion resistance of the spiral, un-plasticized vinyl outer member gives the flexible tube desirable physical properties. It is used, for example, on soil irrigating machinery where it withstands the action of abrasive soils. Furthermore, it has been used to form the basis of a successful permanent irrigation system, by burying Riflex tubes of suitable dimensions in trenches. The corrosive action of the soil has little or no effect on the tube; neither will it crack or split as a result of expansion which is due to ice formation.

11—Twin-screw extruder with die head and automatic control panel



In spite of the intricate appearance and technical interest of the Riflex tube, its manufacture is nevertheless a relatively simple and straightforward process.

Two extruders are used to feed the different plastic materials to a specially constructed crosshead where the soft inner and hard outer members are extruded as perfectly "married" concentric tube. Associated with the extruding die is a rotating knife which removes a spiral strip from the outer member as the tube is extruded, thus leaving a helix of hard protective covering on the soft vinyl inner tube. Obviously, the helix angle of the outer member and, therefore, the degree of protection and flexibility, may be controlled by adjusting the speed of rotation of the knife relative to the speed of extrusion. In order to finish off the Riflex tubes in standard lengths, and to allow easy attachment of fittings, etc., the knife may be stopped altogether and retracted for a controlled period to give any desired length of unbroken, hard vinyl outer surface, as shown above in Fig. 10.

These tubes may be manufactured in all sizes, and in all combinations of wall thicknesses and colors: e.g., by restricting the stock flow of the unplasticized vinyl, the hard spiral outer member may be made with any desired thickness. Similarly, the soft vinyl core can be modified as required. By selecting suitable colors, attractive and easily distinguishable tubes can be made.

For the successful production of

the foregoing examples of specialized extrusion, the equipment must fulfill the following conditions:

1. The crosshead must be constructed to allow uniform flow over large die areas, and must present minimum frictional surface to the plastic flow.
2. The feed of plastic material to the crosshead must be uniform, positively controlled.
3. The extrusion pressure must be high at all times.
4. The extrusion pressure must be such that an even flow of stock is obtained, even under conditions of partial restriction: if possible, at lower than normal temperatures.

The patented production items which form the basis of this article are all manufactured on L.M.P. patented multiple-screw extruders. In these machines, two or more thrust screws of special design operate with their flights intermeshing, and in closely fitting cylinders of correct shape. The closely fitting threads of the intermeshing screws prevent rotation of the thermoplastic, and form an effective closure to the flights of the individual members. The extruder, therefore, becomes a form of positive pressure pump in which the plastic material fed to it, of whatever type it may be, can only move forward at a known, uniform rate. The output of such an extruder is constant, and can be controlled to a nicety by adjustment of the rotational speed of the screws, or by controlling the supply of material to the machine.

It is apparent that the extrusion pressures available under these conditions must be high and uniform. Further, the multiple screw extruder, due to the highly effective masticating action of the intermeshing screws, coupled with the high working pressures, delivers a steady flow of the thermoplastic through the nozzle and die at a comparatively low temperature. The extruded material, therefore, is not overheated, and the product, due to its low temperature, does not tend to collapse or change its shape on leaving the extruder die.

Thus, conditions 2, 3, and 4, and others, are satisfied by the L.M.P. extruder, which is shown in Fig. 11.

<sup>1</sup>See "Meshed Multi-Screw Compounder-Extruder," MODERN PLASTICS 27, 97 (Oct. 1949).



**...makes buyers stop—admire—and buy**

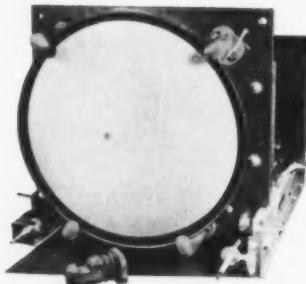
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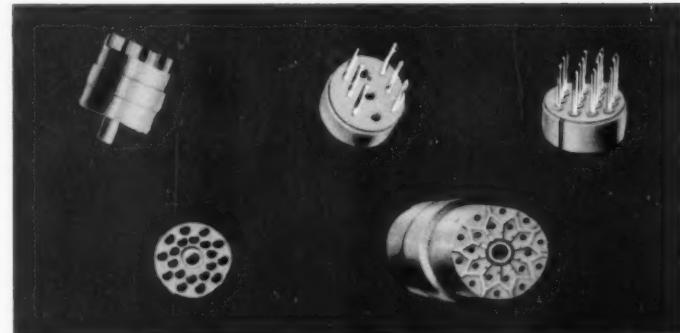
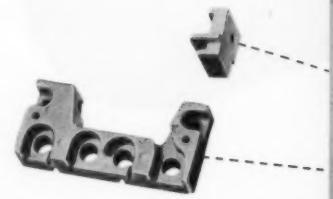
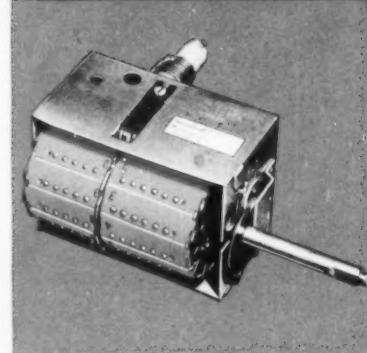
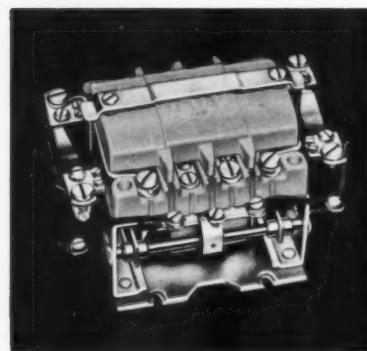
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**new Profits . . .**

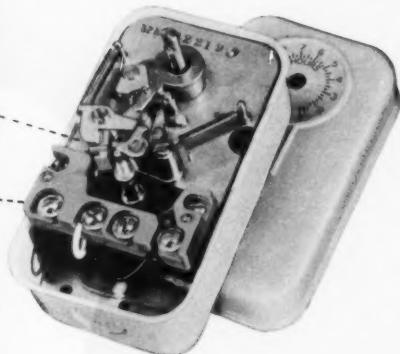
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ALKYD

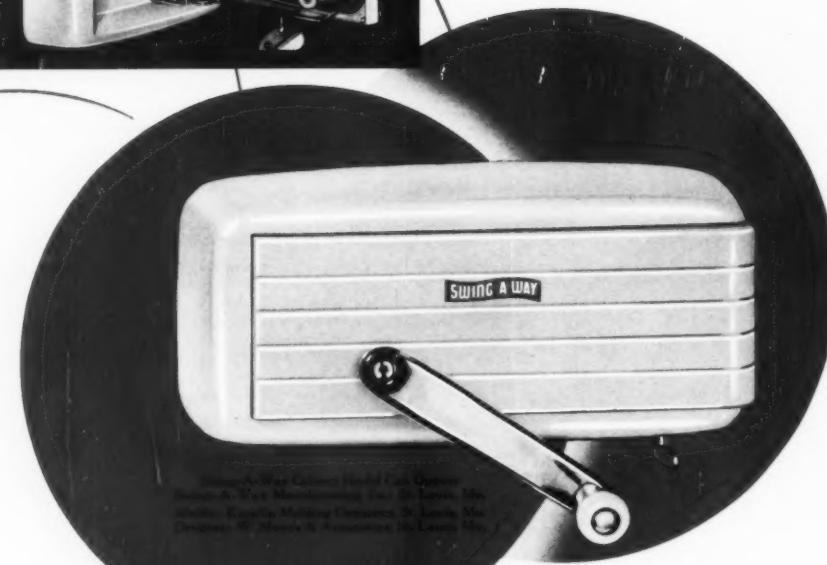
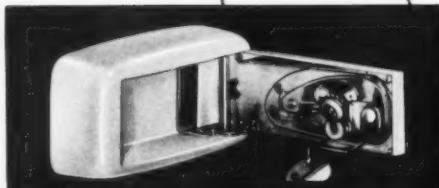
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MOLDED COLOR

# Flash Removal by New Process

Crushed apricot pits in blast of air remove flash  
from thermosets at a fraction of former costs

by DWIGHT H. CHAMBERS\*

**F**LASH removal from thermoset plastics need no longer be a costly and slow process, despite the fact that the finishing room in most plastics molding shops has remained the same for many years. Batteries of drill presses, broaching dies, and endless hand-filing stations are still familiar sights throughout the plastics industry.

Intricately designed parts of many irregular, cored-out parts made in multiple-cavity molds present flash problems that are difficult to solve. Flash, in many cases, is inaccessible to broaches and is time-consuming and costly to remove by hand. With the cost of flash removal soaring upward, and with the realization that a solution must be found to this problem if plastics are to compete with other materials in their proprietary molding operation, Minneapolis-Honeywell set up a project to investigate the problem.

Almost all types of cleaning and burring processes now in use for plastics as well as metals were investigated, and one by one were set aside for one reason or another. The most common cause of failure of these methods was damage to the surface, which gave rise to poor electrical qualities as well as poor appearance. It was not until a year after the project started that a process using crushed apricot pits in an air blast was tried and showed promising signs.

The apricot pit blast was first used on parts having extremely high flashing costs. These parts consisted of types that could not be tumbled or that had metal inserts which must be cleaned without damage to plating or high finish. The process was so successful here that savings of 50 to 60 hr. per thousand were shown on several jobs. Realizing that the process appeared to be the right approach, a

search was started for equipment that would handle large quantities of parts.

## Standard Machine Used

Early in 1949, the Wheelabrating process was considered. After several trial runs, a machine<sup>1</sup> was installed. For those who are not

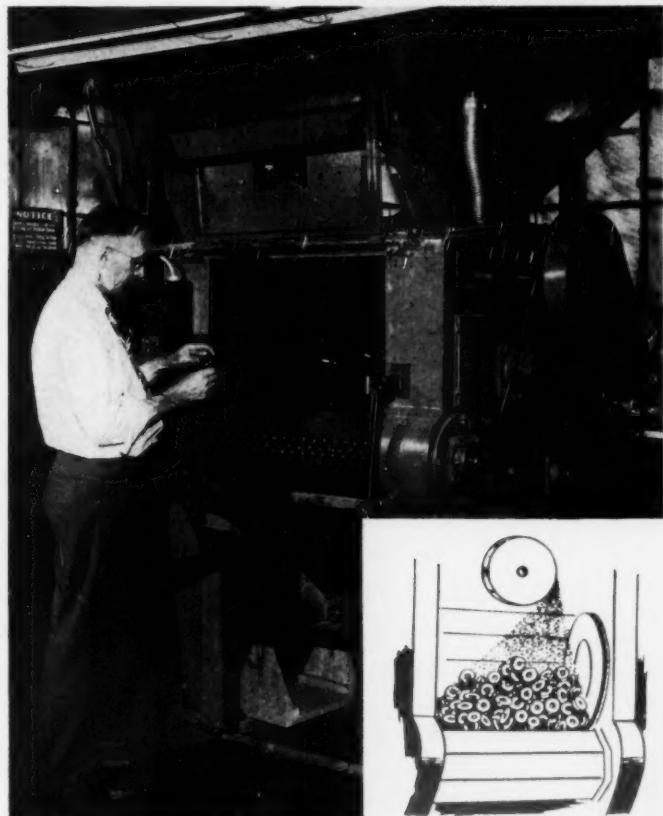
\*Manufactured by the American Wheelabrator & Equipment Co., Mishawaka, Ind.

familiar with the process, Wheelabrating combines tumbling of parts on an endless cradled belt with an overhead wheel throwing abrasive in a blast pattern across the tumbling area. Previously this type of equipment had been used entirely for metals and with a metal abrasive. The only change in the process

(Continued on p. 94)

New flash-removal process embodies principle sketched in inset. Parts are tumbled on endless cradle belt, while overhead wheel throws abrasive blast

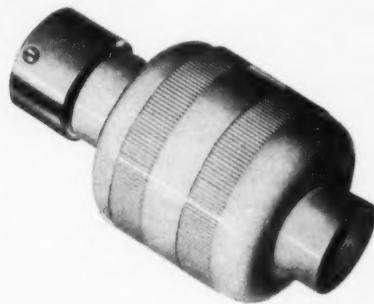
ALL PHOTOS COURTESY MINNEAPOLIS-HONEYWELL REGULATOR CO.



\*Methods engineer, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.



THIS WATER FILTER is molded of Melmac because it requires high resistance to repeated changes of hot and cold water. (Molded by Transmatic Plastics Co. for Aqua-Mite Filter Co.)



THIS AIR VENTILATOR PART is molded of durable Beetle to assure easy cleaning, low maintenance cost and long wear. (Molded by Kurz-Kasch, Inc. for Joy Mfg. Co.)

# ...and they all spell progress

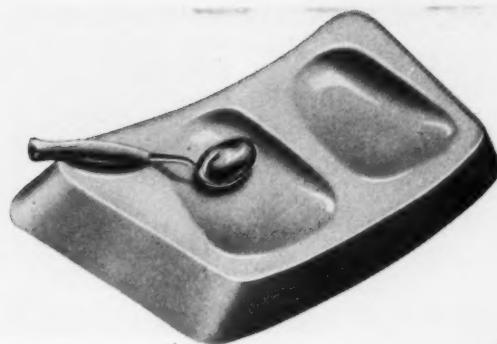
**sparked by**

Separately, each of these illustrations represents a step forward in the design, utility, appearance, value or efficiency of a molded plastic product or part.

Put 'em together and they spell progress in molding over a broad front. They show how Cyanamid plastic molding compounds are providing the answers to more and more problems because of their strength, light weight, durability, color, arc resistance, acid and solvent resistance, fast cure and other properties.

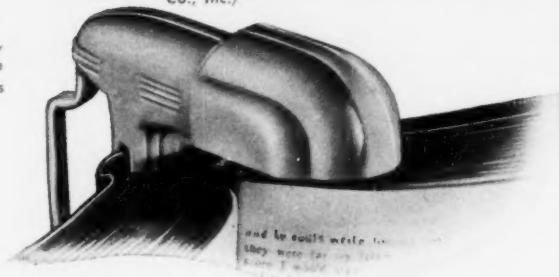
Are you making satisfactory progress on your ideas? Any of Cyanamid's materials—Beetle\* Molding Compounds... MELMAC\* Molding Compounds... LAMINAC\* Laminating Resins—may provide the right solution. Let's work out your problem together!

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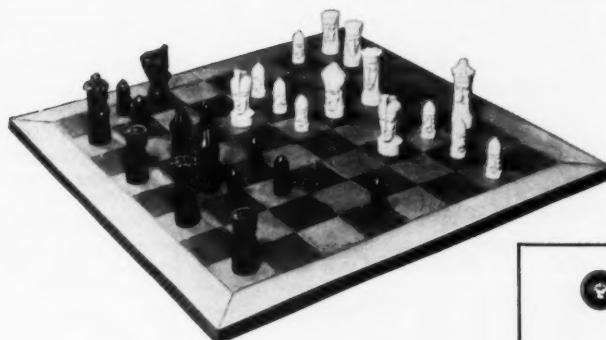
THIS CHILD'S FEEDING DISH is given shatter resistance, heat insulation, pleasing color and surface texture by Melmac. (Molded by Imperial Molded Products Corp. for Givens & Co.)

THIS "MAGIC BOOKLITE" is assured long life, lasting beauty and correct electric insulating properties by Beetle. (By Eagle Electric Mfg. Co., Inc.)



## CYANAMID PLASTICS

THIS SUNKIST DE LUXE JUICIT is molded of Beetle to provide excellent electric insulating properties plus resistance to attack from fruit acids. (Molded by Breyer Molding Co.; marketed by Chicago Electric Mfg. Co.)

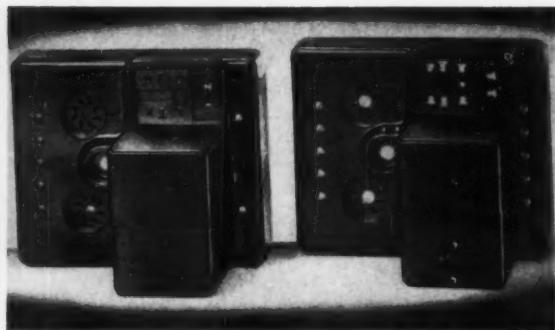
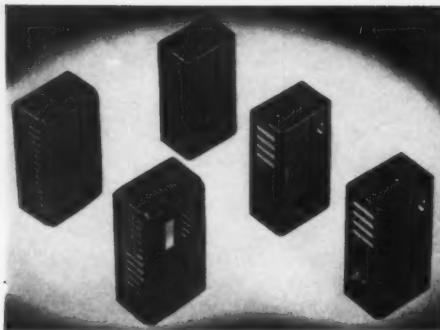


THIS UNUSUAL CHESS SET offers color and design appeal, pleasing texture, great durability and resistance to grime and sweat because it is molded of Melmac. (Molded by Eldon Mfg. Co.)



AMERICAN Cyanamid COMPANY

PLASTICS DEPARTMENT  
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Molded thermoset parts to which new flash-removal process has been applied are illustrated before and after the operation. Equipment used in new technique will handle a large variety of shapes and sizes, loses little time in changeover

as applied to thermosets was the substitution of crushed apricot pits of 20 to 40 grit for the abrasive. Minor difficulties were encountered, but one by one these were eliminated. Dust presented the greatest trouble but was overcome by injecting steam into the flow of pits as they enter the blast mechanism. The moisture picked up from the steam not only settles the dust but appears to reduce the brittleness of the pits. This has resulted in longer life for the pits. Abrasive is lost at the rate of approximately one pound per hour, and at the present cost of 7 cents per pound, the low cost of operation can readily be seen.

At present, Minneapolis-Honeywell is completely flashing approximately 60% of its production with Wheelabrating. General-purpose phenolics make up the bulk of this amount but some medium-impact phenolics as well as urea and melamine are responding equally well. A wide variety of shapes and sizes are processed daily with practically no time lost in changeover.

Most parts are run with the same machine settings. Only in cases of very small or large parts is any adjustment necessary. Small parts of the  $\frac{1}{4}$ - and  $\frac{1}{2}$ -in. variety which would be lifted by the blast and broken up are placed in a small, inexpensive wire barrel which revolves on the belt. Very large parts which would be damaged at normal tumbling speed are tumbled at half speed, and in some cases the belt is moved intermittently by means of an interval timer. This practically

eliminates any effect of the tumbling operation itself, and acts only to revolve the parts under the blast in a gentle motion. The machine is very versatile, and any number of combinations of blast and tumbling can be used with only simple machine adjustments.

In several high-production parts, costs previously ran between 2 and 6 hr. per thousand for tumbling and broaching. Present costs range from 0.2 to 0.7 hr. per thousand. With fair volume, savings on three such parts alone are enough to pay for this process in one year. On smaller parts, where each load runs as high as 5000 pieces and processing time is approximately 15 min. per load, costs are practically nil.

With results such as these, it is not surprising that a saving of close to \$100,000 has been realized at Minneapolis-Honeywell in the first year on labor alone. Taking into consideration the cost of broaches and fixtures which would otherwise have been necessary, this figure could well be increased by 25 or 30 percent.

#### Low Operation Cost

The Wheelabrator machine recommended for general use has a load capacity of two cubic feet. This machine is completely self-contained and requires only 16 sq. ft. of floor space. A total of 8 hp. (220 volts) is required to operate the machine, including the exhaust system. Power plus abrasive brings the total cost of operation well below that of one machine or bench operator.

In a shop where sufficient volume warrants two machines, costs can be further reduced by using only one operator for both machines. It has been found that cycle times per load will average 15 min. with about 2 min. of this time being sufficient to load and unload; this makes it possible for one operator to service several machines and still have time for stock handling and inspection.

Wheelabrating, when applied properly, will give very satisfactory results; however, it should not be considered a cure-all. It is important that its limitations be realized and studied. It will be found that sufficient mold maintenance to insure minimum flash thickness is far more economical than allowing molds to deteriorate to the point where costly hand finishing is necessary. It is impossible to peg the limitations in thousandths of an inch, since too many variables enter the picture. It can only be stated that very little difficulty has been experienced. In several cases, blast time was increased to handle more than average flash, but in no case has there been complete failure.

Another phase of Wheelabrating which promises to be of great interest is the turntable-type machine. This machine will handle parts that cannot be tumbled, as well as large moldings in the radio cabinet category. One of these machines is now being installed at Minneapolis-Honeywell. Its possibilities will be discussed in these pages at a later date.

Tenite-handled Weed Bird  
garden tools and Heavy  
Duty pruning shear manufactured  
by The J. T. Henry Manufac-  
turing Co., Hamden, Conn. Handles  
injection molded by The  
Watertown Manufacturing Co.,  
Watertown, Conn.



## for outdoor work



Colorful Tenite handles make garden tools hard to lose in dirt or grass, and the plastic remains peelproof through sun, showers, and steady use. In addition, Tenite affords a surface that is comfortable to the touch for gardening

on either hot or cold days. Molded hollow in a single piece and forced onto metal shafts, these handles are firmly anchored. They are curved to fit the hand, and have a molded crosshatched surface which affords a sure grip.

Tenite's toughness, dimensional stability, weather resistance, and availability in limitless colors account for the wide use of this plastic for many other kinds of gardening or farm equipment. A few examples are transparent plant protectors, irrigation siphon tubes, and electric-fence gates and charger housings.

Write for more information about Tenite and its uses to **TENNESSEE EASTMAN CORPORATION**  
(Subsidiary of Eastman Kodak Company), **KINGSPORT, TENNESSEE**.

# TENITE

*an Eastman Plastic*

Information regarding Tenite is also obtainable through representatives located in Chicago, Cleveland, Dayton, Detroit, Leominster (Mass.), Los Angeles, New York, Portland (Ore.), Rochester (N. Y.), St. Louis, San Francisco, and Seattle; and elsewhere throughout the world from Eastman Kodak Company affiliates and distributors.

Just as there'll always be a Broadway and the need for lights to strengthen its spirit — so also — there'll always be a need for strong plastics and Claremont Fillers to provide the strength factors! As we see it, there are two types of finished plastics — passive and active. Passive plastics need no strength . . . they're light, thin framed and basically decorative. In them, muscle would be a waste of strength. On the other hand, compression molded pieces are active plastics. They're handled, they do work. They comprise metal components

*Claremont*

all muscle...NO fat!

*Cotton Fillers*

molded in place. They're threaded, tapped, undercut, multi-walled and recessed. Such volumes require strength—high impact strength against shock or breakage—the kind of graded, stepped-up muscle building strength which Claremont Cotton Fillers are furnishing to the industry's best known and most widely used heavy-duty formulations!

A nominally strong general purpose phenolic may call only for Claremont Cotton Flock . . . while an extremely high impact resistant compound may require Claremont Cotton Cord. The needs between these extremes are satisfactorily met with Claremont Cotton Thread or Claremont Macerated Fabric.



Formulations, fortified with Claremont Fillers, and contributing the exact toughness desired, never adversely affect any of the other desirable properties of the basic chemicals employed. Samples of Claremont Fillers in neutral or black and in quantities sufficient for your laboratory test runs are available upon request. Inquiries invited!

**CLAREMONT**  
WASTE MANUFACTURING CO.

"The Country's Largest Manufacturer of Flock" CLAREMONT, N. H.

# Organosol Formulation

by ERIK R. NIELSEN†

Thinners for use as dispersing media for vinyl resins in the production of organosols were investigated. Non-cyclic aliphatic hydrocarbons cannot be used as sole components for organosol thinners, since they are incapable of swelling the resin. The size and structure of the thinner molecule correlate with its swelling power for the vinyl resin, as shown by viscosity measurements. A number of solvents possess the optimum swelling capacity (or close thereto) to make them ideally suited as one component thinners in organosol systems. Such thinners are the cycloparaffins and some of the terpenes. These thinners offer the advantage of making possible organosols with high solids content and low, stable viscosity.

THE standard organosol consists of resin particles suspended in a mixture of organic liquids that are incapable of dissolving the resin at normal temperatures. The mixture of organic liquids is chosen so that it has no more than a slight swelling action on the resin particles.<sup>1</sup>

An investigation was undertaken to determine the possibility of using a single organic liquid rather than a mixture as the suspending medium; that is, the possibility of selecting a single volatile liquid that, in combination with the plasticizer, would exert the optimum swelling action on the resin or approximate it. By optimum swelling is meant the minimum necessary to make the resin particles float. Under that condition, the swollen particles take up minimum space, and the minimum amount of liquid is consumed in the swelling process, with the result that the maximum number of particles can be packed into the suspension before the point is reached when the last free liquid is used up and the suspension gels.

In the case of a liquid with ex-

cess swelling capacity, the swollen particles become larger and more liquid is used up in the swelling process. Gelation will, therefore, set in for a lower concentration than in the case of a liquid with optimum swelling capacity; and at the same time, the degree of thixotropy is also increased.

### Preparation of Organosols

The organosols were produced by grinding in  $\frac{1}{2}$  gal. porcelain ball mills for 16 hr. or longer, depending

on the swelling capacity of the suspending medium; the poorer swelling agents required the longer grinding time. The viscosities were measured immediately after grinding at 70° F. with a Brookfield viscosimeter at spindle speeds of 4, 10, and 20 r.p.m.

The resin used in this study was the organosol resin marketed<sup>2</sup> under the trade designation Vinylite VYNU. A quantity of blend 62 of this resin which was sufficient to last throughout the investigation was set aside. This blend was selected from a number of available VYNU blends as the one giving rise to the lowest viscosity. For this selection, samples of the various blends were plasticized by diethyl phthalate (10 to 4 resin: plasticizer ratio) and ground in xylene for 16 hr. to produce suspensions with a non-volatile content of 50%. The viscosities in poises as measured immediately after grinding were as

<sup>1</sup>By Bakelite Div., Union Carbide & Carbon Corp. Carbide and Carbon Chemicals Corp.

Table I.—Viscosity of Vinylite VYNU Resin Suspensions in Various Thinners<sup>a</sup>

Thinner	Viscosity in poises of VYNU suspensions of non-volatile percentages shown										
	40%	45%	45.5%	46%	47%	50%	52%	53%	53.5%	54%	55%
Benzene	65	105		125	S						
Toluene	4.2	29	2600	S							
Xylene	5.3	10		13		30.4		81.5		S	
Tollac	4.0	6				9.5		156.0		S	
Solvent											
naphtha	9.5			13.5		23.6	42		85	S	
Ennjay-1				1.5		2.9	4.2	5.9	8	S	
Ennjay-2				1.8		6.1	9.6	18		S	
High Flash-200				2.2		7.4				32	74
Carbon tetrachloride				3.4	5.0		9.6	S			

<sup>a</sup> Resin (blend 62) plasticized with diethyl phthalate in resin-plasticizer ratio 10:4. Viscosities measured with a Brookfield viscosimeter at a spindle speed of 4 r.p.m. immediately after milling.

S = solid.

<sup>1</sup>Reg. U.S. Pat. Off.

<sup>2</sup>Armour Research Foundation.

<sup>1</sup> "A Handbook on Coatings-Vinylite Resin Dispersions," by G. M. Powell and R. W. Quarles, Official Digest, Federation of Paint and Varnish Production Clubs, No. 263 (Dec. 1946).

follows: Blend 8: 308; Blend 62: 30; Blend 89: 102; Blend 91: 96.

In order to gain the objective, i.e., the one component thinner of optimum swelling power, a number of different types of solvents were investigated. For each solvent, organosols of varying non-volatile content were prepared by grinding in ball mills for 24 to 60 hours. The resin was in each case plasticized with dioctyl phthalate (ratio 10:4), and the viscosities were measured immediately after grinding.

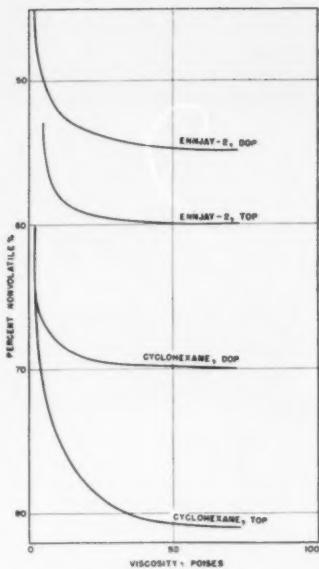
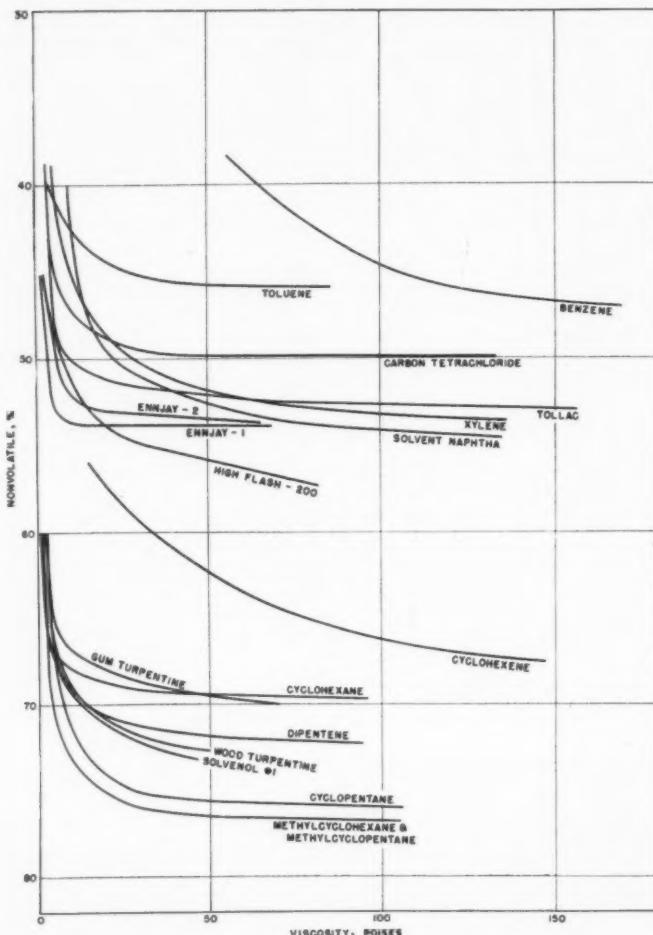
*Non-cyclic petroleum hydrocarbons, paraffinic or predominantly so.*—Petrolene, Troluoil, V. M. & P. naphtha, Apcolene, Apco thinner, Solvasol, Solvsol A, and Solvsol

19-27 were investigated. They all behaved in a similar manner; that is, heavy suspensions were formed even at a low non-volatile content (30 to 40%) and the suspensions settled rapidly. Microscopic examination showed that this type of thinner had no swelling power for the resin and would, therefore, be incapable of forming the desired gel-type suspension.

*Olefinic Hydrocarbons.*—Only a sample of mixed amylene was investigated. It behaved like the paraffinic hydrocarbons.

*Chlorinated hydrocarbons.*—Carbon tetrachloride and trichloroethylene were both investigated. The milling time was 24 hours. The data

1—Viscosity of VYNU suspensions plasticized with dioctyl phthalate (10:4)



2—Suspensions with two plasticizers

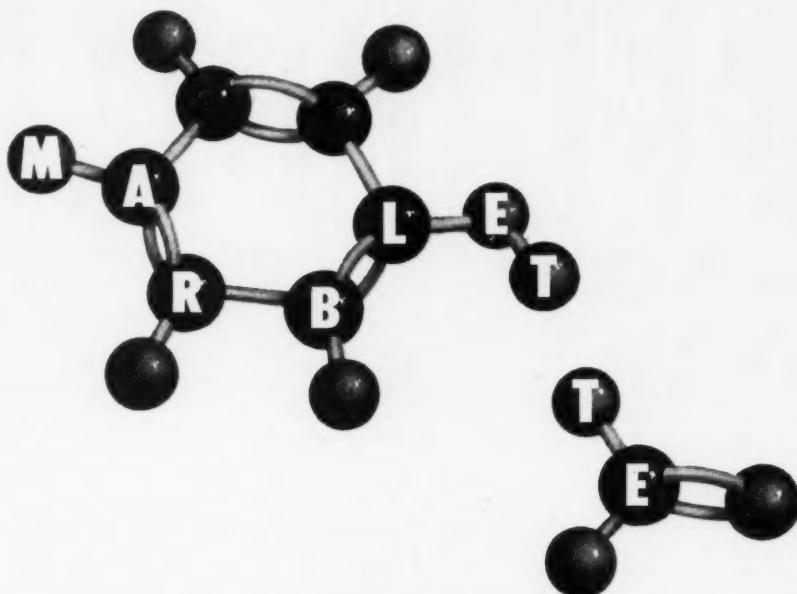
obtained for carbon tetrachloride are presented in Table I and Fig. 1. Trichloroethylene at a 40% non-volatile content gave a suspension with a viscosity of 65 poises as compared to 3.4 poises for the corresponding carbon tetrachloride batch and was not investigated further.

*Aromatic petroleum and coal tar hydrocarbons, and hydrogenated petroleum hydrocarbons.*—The investigation covered benzene, toluene, TOLLAC, xylene, solvent naphtha, High Flash-200, ENNJay-1, and ENNJay-2. The milling times were 40 to 48 hours. The data are presented in Table I and Fig. 1.

*Unsaturated non-benzenoid cyclic compounds.*—Cyclohexene and thiophene were investigated. The data for cyclohexene are shown in Table II and Fig. 1. The milling time was 24 hours. Thiophene gave a solid gel even at a non-volatile content of 40% and was not studied further.

*Cycloparaffins.*—Cyclopentane, methylcyclopentane (pure and technical), cyclohexane, and methylecyclohexane were investigated. The milling time was 60 hours. The viscosity data are given in Table II and Fig. 1.

*Terpenes.*—Gum turpentine, wood turpentine, Solvenol #1 (pine oil), and dipentene were investigated



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Table II.—Viscosity of Vinylite VYNU Resin Suspensions in Various Thinners<sup>a</sup>

Thinner	Viscosity in poises of VYNU suspensions of non-volatile percentages shown							
	60%	65%	67.5%	70%	72%	75%	76%	77%
Cyclohexane	1	2.2	6.8	S				
Cyclopentane	2.7	3.9	7.0	7.9	26.5	100		
Methylcyclohexane		2.3		3.9	22.0		S	
Methylcyclopentane		2.2	2.6	4.1	4.1	20.0	S	
Methylcyclopentane, technical		1.9		2.6	28.0		S	
Dipentene	2.0	2.7		14.0	58.2			
Gum turpentine	2.4	4.0		70.0				
Wood turpentine	2.0	3.4		15.0				
Solvenol #1	2.4	4.9		12.5				

<sup>a</sup> See note to Table I.  
S = solid.

with milling time of 60 hours. The viscosity data are presented in Table II and Fig. 1.

Since the plasticizer undoubtedly played an important part in the swelling of the resin, a comparison was made between two plasticizers—dioctyl phthalate and trioctyl phosphate. The viscosity data are in Tables III and IV and Fig. 2.

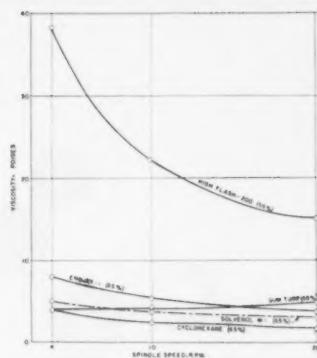
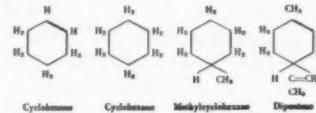
The Brookfield viscosimeter permits determination of viscosity at three different spindle speeds and, therefore, affords an opportunity to study the thixotropy of the suspensions. In Fig. 3 are shown the viscosities at different spindle speeds of suspensions prepared with High Flash-200, Ennjay-1, cyclohexane, and gum turpentine, and Solvenol #1.

Quite early in the investigation, it was noted that the viscosity of a given suspension varied more or less with the time which had passed since the time of milling. An aging study was, therefore, carried out with High Flash-200, Ennjay-1, cyclohexane, and methylcyclopentane. One-gallon batches were prepared for this study, and the batches were divided into smaller samples which were filled into tightly sealed jars, so that a fresh sample could be used for each viscosity test and errors due to solvent evaporation could be avoided. (See Table V and Fig. 4.)

#### Discussion of Results

**Effect of molecular size and structure of thinner.**—A study of the series benzene, toluene, and xylene (Fig. 1), shows that the size of the molecule is important in determining the swelling capacity of a thinner; the larger the molecule, the less is the capacity to penetrate and swell the resin, and within limits,

the larger will be the quantity of resin which can be suspended. However, this is only one of the factors that determine the swelling power of a thinner. Another factor is the structure of the thinner molecule, upon which depends the degree of molecular attraction between the resin and the thinner molecules. This may be illustrated by the series benzene, cyclohexene, and cyclohexane (Fig. 1). Here there is little difference in the size of the molecules, but there is, nevertheless, a great difference in the behavior of the three thinners as suspending media. The above factors are probably not the only ones of importance. The degree of stiffness of the thinner molecule and the extent of association between plasticizer and thinner molecules are, perhaps, also important factors. In other words, the value of a thinner for use in an organosol is likely to be based upon a compromise between different factors which more or less counteract each other. This may be illustrated by the series cyclohexene, cyclohexane, methylcyclohexane, and dipentene:



#### 3—Viscosities vs. spindle speeds

As shown in Fig. 1, cyclohexane is a good suspending medium. Cyclohexene has a molecule which is only slightly smaller than that of cyclohexane, but because of the double bond there is, perhaps, a greater molecular attraction between cyclohexene and the resin, with the result that cyclohexene becomes distinctly inferior to cyclohexane as an organosol thinner. The structure of methylcyclohexane is the same as that of cyclohexane, except for the methyl group, and this increase in the size of the molecule is apparently responsible for the fact that methylcyclohexane is distinctly superior to cyclohexene as an organosol thinner. In the case of dipentene, we probably have an illustration of the balancing effect of double bonds as against an increase in the size of the molecule, the net result being that dipentene is not greatly different from cyclohexane in its behavior as an organosol thinner.

Methylcyclohexane and methylcyclopentane, as shown in Fig. 1, are practically identical in behavior. This might seem to be contradictory to the above discussion, since it would appear that methylcyclohexane would have the larger molecule

Table III.—Viscosity of Cyclohexane Suspensions of Plasticized Vinylite VYNU Resin<sup>a</sup>

Plasticizer	Viscosity in poises of VYNU suspensions of non-volatile percentages shown							
	60%	65%	67.5%	70%	72%	75%	77%	
Dioctyl phthalate	1	2.2	6.8	S				
Trioctyl phosphate		1.4		5	6.7	8.4	17	

<sup>a</sup> See note to Table I, except for identity of plasticizer.  
S = solid.

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Table IV.—Viscosity of Ennjay-2 Suspensions of Plasticized Vinylite VYNU Resin<sup>a</sup>

Plasticizer	Viscosity in poises of VYNU suspensions of non-volatile percentages shown									
	45%	50%	52%	53%	54%	55%	56%	58%	60%	
Diethyl phthalate	1.8	6.1	9.6	18	S					
Triethyl phosphate						6.0	7.2	9.7	S	

<sup>a</sup> See note to Table I, except for identity of plasticizer.

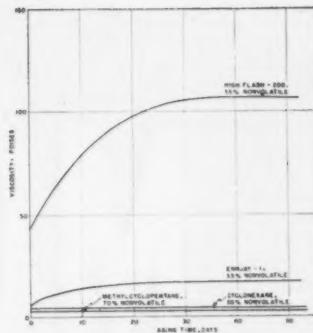
S = solid.

of the two. However, the cyclohexane ring is not planar, but has a saddle or chair structure which results in a smaller sized molecule than in the case of a planar ring. Technical methylcyclopentane is practically as good as the pure compound (Table II), even though it contains about 25% impurities, mainly cyclohexane together with small amounts of normal hexane and benzene. While not commercially available at present, this solvent could probably be readily made available at moderate cost if sufficient demand were created for it.

**Effect of plasticizer.**—The choice of plasticizer will have an important bearing on the maximum non-volatile content obtainable with a given thinner or suspending medium. This is because the plasticizers generally also are swelling agents for the resin, and in some cases, even better swelling agents than the suspending medium used. A good illustration of this point is the comparison of the two plasticizers diethyl phthalate and triethyl phosphate when used in conjunction with a thinner aromatic in nature, Ennjay-2, versus one aliphatic in nature, cyclohexane (Tables III and IV and Fig. 2). For both thinners, the plasticizer with the lesser swelling power, triethyl phosphate (larger molecule), makes possible organosols with higher non-volatile content. In the case of cyclohexane, with only a very slight swelling power for the resins, the maximum non-volatile content is raised more than 10% when substituting triethyl phosphate for diethyl phthalate, whereas in case of the better swelling agent, Ennjay-2, the difference is only about one half of that. It can readily be seen that in the case of methylcyclopentane which has still less swelling power for the resin than cyclohexane, the substitution of triethyl phosphate for diethyl phthalate would bring the maximum non-volatile content to about 85-87% or close to the theoretical maximum.

**Thixotropic effects.**—Thixotropy is a problem only with organosols carrying excessively swelled particles; the higher the swelling, the greater the tendency of the resin particles to cohere on contact to produce thixotropic sols. This tendency can be measured in two ways: first, by measuring the viscosity as a function of the ages of rotation of the viscosimeter spindle and, second, by measuring the viscosity as a function of the age of the sol. Figure 3 shows the viscosity as a function of the spindle speed; the steeper the slope, the more thixotropic is the sol. Or-

ganosols made with methylcyclopentane, cyclohexane, and gum turpentine show very little or no thixotropy, whereas the aromatic High Flash-200 is highly thixotropic. Figure 4 shows the change in viscosity upon aging of the organosol. Cyclohexane and methylcyclopentane organosols show no change in viscosity upon aging, whereas those made with the better swelling agents, Ennjay-1 and High Flash-200, show an increase in viscosity upon aging. The reason for the above differences is evidently that the thinners cyclohexane and methylcyclopentane fail to swell the resin particles sufficiently to make cohesion possible under the conditions of an organo-



4—Influence of age on viscosity

ganosols made with methylcyclopentane, cyclohexane, and gum turpentine show very little or no thixotropy, whereas the aromatic High Flash-200 is highly thixotropic. Figure 4 shows the change in viscosity upon aging of the organosol. Cyclohexane and methylcyclopentane organosols show no change in viscosity upon aging, whereas those made with the better swelling agents, Ennjay-1 and High Flash-200, show an increase in viscosity upon aging. The reason for the above differences is evidently that the thinners cyclohexane and methylcyclopentane fail to swell the resin particles sufficiently to make cohesion possible under the conditions of an organo-

### Conclusion

Cycloparaffins and some terpene compounds constitute a group of thinners which, in contradistinction to other thinners, are characterized by their ability to produce gel suspensions of vinyl resins with a high non-volatile content and with a viscosity that is stable to aging of the organosol or gel suspension. The choice of thinner from the above group will depend upon various factors, such as non-volatile content desired and compatibility with the plasticizers to be used.

### Acknowledgments

The technical methylcyclopentane used in this investigation was obtained through the cooperation of Mr. A. E. Buell of the Phillips Petroleum Co. The microscopy investigation of the non-cyclic aliphatic hydrocarbon suspensions was carried out by Walter C. McCrone of the Armour Research Foundation.

Table V.—Viscosity vs. Age of Suspensions of Vinylite VYNU Resin<sup>a</sup>

Age of suspension	Viscosity in poises of VYNU suspensions				Methyl-
	Ennjay-1, 53% non-volatile	High flash-200, 55% non-volatile	Cyclohexane, 65% non-volatile	cyclopentane, 70% non-volatile	
0	5.8	38.0	4.0	3.0	
2	8.2	50.0	4.4	3.0	
5	12.0	60.0	4.4	3.0	
10	14.0	80.0	4.4	3.0	
15	15.0	90.0	4.0	3.0	
24	16.4	104.0	4.5	3.0	
36	16.4	103.0	4.5	3.0	
50	16.4	105.0	4.5	3.0	

<sup>a</sup> See note to Table I, except for identity of plasticizer.



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# Gelation Timer For Adhesives

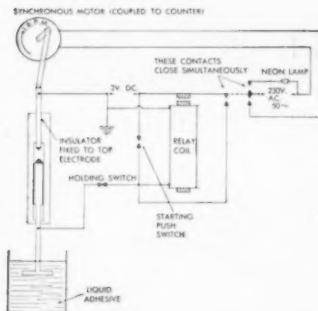
by N. A. DE BRUYNE\*

ONE of the characteristics of a synthetic resin, significant both for control of production by the maker and for its subsequent behavior in the hands of the customer, is the "gelation time", defined as the time taken at a stated temperature for a catalyzed resin to gel. Many determinations of "gelation time" and the tedium and the man hours used in repeated examination of the catalyzed resin suggested that some self-indicating device would be desirable. The apparatus developed has not only been successful in relieving pressure on the laboratory staff, particularly as it can be left working all night and on weekends, but has eliminated the uncertainty found in any subjective test.

The essential difference between the mechanical behavior of a liquid and a gel may be summarized by the statement that a liquid has a small Maxwell relaxation time and a gel has a large one.<sup>1</sup> For the purpose of this test it was assumed that when the catalyzed resin had acquired a relaxation time of the order of half a minute, it could be said to have gelled. This choice of time allows the gelation time to be indicated to the nearest minute and it is sufficiently long to distinguish between a state of high viscosity and one of incipient rigidity.

\*Aero Research Ltd., Duxford, Cambridge, England  
†N. A. de Bruyne, Proc. Phys. Soc., LIII, 281 (1941)

## Operation principle of time control



The principle of the instrument<sup>2</sup> is shown in the sketch below. A weighted disk of  $\frac{7}{8}$  in. diameter immersed in the resin is subjected to a simple harmonic vertical motion with a periodic time of 1 min. by connection to a geared synchronous electric motor. The effective weight on the disk is about 16.5 grams; this weight is not at all critical. As the resin sets, a point is reached at which the stiffness is sufficient to support the weight of the disk during a 30-sec. half cycle. Up to this point, the connecting link has been under tension both during its up and down strokes, but, as soon as the disk is supported, the link on its down stroke becomes subjected to a compression, causing an electric contact in the link to close a low voltage circuit. This in turn opens a relay irreversibly, stops the synchronous motor, and lights a small neon lamp to attract attention. The gelation time is then read off in minutes on the counter and, after resetting, the apparatus is ready for another determination. As originally made the device operated by breaking a contact in the connecting link at the moment of gelation; however, the instrument was found to be sensitive to vibration as the gelation point was approached and as the tension in the link correspondingly tended to a zero value. This trouble was overcome<sup>3</sup> by using a contact requiring an appreciable displacement (say 0.5 mm.) before closing.

In the production model of the

\*Patent applied for.

<sup>2</sup>At the suggestion of P. A. Rottenberg, Techne, Ltd., Duxford, Cambridge, England

instrument,<sup>4</sup> the width has been kept small so that a large number of instruments can be erected side by side above a thermostatically controlled water bath. The minutes counter is set to zero by a knob on the right hand side, and, as soon as the resin and catalyst are mixed, the button marked "start" at the top right hand corner is pushed in. This starts the synchronous motor and the minutes counter. The "holding switch" at the bottom should also be switched to the "on" position; the purpose of this switch is to prevent a spurious interference with the electric circuit while the plunger (already immersed in the glue mix) is screwed into the socket of the pot life timer. The vertical position of the timer should be adjusted so that the plunger is well immersed in the resin. For consistent results, the plunger should be about  $1\frac{1}{4}$  in. from the surface when at the top of its stroke and should not be less than  $\frac{1}{2}$  in. from the bottom of the jar when at the bottom of its stroke. As soon as the plunger is oscillating correctly in the resin, the holding switch should be turned to the "off" position. The timer can now be left unattended. The results obtained with this instrument are presented in Table I. It will be seen that over a wide range of products the gelation timer agrees satisfactorily with direct observation. Tests show that the size of the beaker containing the resin is without influence on the indicated gelation time for an inside diameter of 1.6 inches or more.

<sup>4</sup>Designed by P. D. Ward, Techne, Ltd., Duxford, Cambridge, England

Table I—Gelation Time of Adhesives

Resin* and catalyst	Gelation time by inspection	Gelation time by timer
Aerolite 320 + 10% SCH	25 min.	26 min.
Aerolite K + 10% CHA	2 hr. 6 min.	2 hr. 15 min.
Aerolite K + 14% FH.60	20 hr. 22 min.	21 hr. 0 min.
Aerolite 303 + GS.30	3 hr. 17 min.	3 hr. 19 min.
Aerodux 185 + HRP.150	3 hr. 18 min.	3 hr. 18 min.

\* Aerolite 320 is a urea-formaldehyde resin of about 40% solids content and a viscosity of 3 poises at 21°C.; it forms a much weaker and more deformable gel than the other resins listed. Aerolite K is a urea-formaldehyde resin with a solids content of 46 to 70% and a viscosity of 160 poises at 21°C. Aerolite 303 is a gap-filling urea-formaldehyde resin containing a filler. Aerodux 185 is a resorcinol-formaldehyde resin.



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# PLASTICS DIGEST\*

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## Materials

**MULTILINKED POLYAMIDES.** J. R. Schaeffgen and P. J. Flory. *J. Am. Chem. Soc.* 72, 689-701 (Feb. 1950). Tetrachain and octachain polyamides in the form of fibers were converted to network structures by reaction of their terminal carboxyl groups with stoichiometric proportions of hexamethylenediamine. The interlinking reaction appears to be nearly quantitative, and the procedure therefore lends itself to the preparation of networks of known structure determined by the type and proportion of multifunctional reactant used in the initial preparation of the thermoplastic multichain polymer. The network polymers used in this manner and called "multilinked" polyamides possess at room temperature many of the properties characteristic of linear and multichain polyamides, such as high crystallinity, ability to be oriented to form strong fibers, and high melting points. In addition, they possess the properties characteristic of network structures such as insolubility in common polyamide solvents and rubberlike elasticity at temperatures above the melting point of the crystallites. In the latter property they are remarkably similar to natural rubber. The stress-strain curve at 229 to 280°C. is of the same shape as that for vulcanized rubber at room temperature, including a steep rise at high elongations due to crystallization on stretching. The ultimate tensile strength and elongation are very nearly the same as those observed for crystallizing rubbers vulcanized to a similar degree of cross-linking.

**STABILIZATION OF ZEIN FILAMENTS.** C. B. Croston. *Ind. Eng. Chem.* 42, 482-4 (Mar. 1950). Essentially anhydrous curing mixtures consisting

of an inert solvent, aldehyde, and strong acid have a remarkable stabilizing effect on zein fibers. The cure is very rapid at 100°C. and produces irreversible formaldehyde crosslinks. The stabilization is most evident in the reduction of shrinkage which is reflected in unusual strengths of the fiber after boiling in acid dye baths.

**DIPHOSPHATE ESTER PLASTICIZERS.** R. H. Oliver, N. M. Wiederhorn, and R. B. Mesrobian. *Ind. Eng. Chem.* 42, 488-91 (Mar. 1950). Studies on the creep behavior of vinyl chloride resin plasticized with new derivatives of phosphoric esters are reported. The plasticizing efficiency of the diphosphoric esters, compared by tensile creep with commercially used plasticizers, is quite satisfactory over a wide temperature range.

**POLYMERS AND COPOLYMERS OF *o*-ACETOXYSTYRENE AND *o*-HYDROXYSTYRENE.** C. S. Marvel and N. S. Rao. *J. Polymer Sci.* 4, 703-7 (Dec. 1949). *o*-Hydroxystyrene did not copolymerize with styrene and butadiene in GR-S-type systems. A terpolymer of these three monomers was obtained by copolymerizing *o*-acetoxystyrene, styrene, and butadiene in carbon tetrachloride solution by the action of stannic chloride followed by hydrolysis of the acetate groups in the polymer with dilute hydrochloric acid in dioxane solution. The polymer thus obtained did not improve the tack of GR-S.

**PREPARATION OF ARYL ACRYLATES AND METHACRYLATES BY PYROLYSIS OF THE CORRESPONDING ACETOXY ESTERS.** E. M. Filachione, J. H. Lengel, and W. P. Ratchford. *J. Am. Chem. Soc.* 72, 839-41 (Feb. 1950). *p*-Chlorophenyl, *m*-tolyl, *o*-allylphenyl, *p*-*tert*-butylphenyl, *p*-*tert*-amylphenyl, and *p*-cyclohexylphenyl  $\alpha$ -acetoxypropionates and phenyl  $\alpha$ -acetoxysobutyrate were

prepared. The acetoxypropionates were pyrolyzed at 500 to 550°C. to give satisfactory yields of the corresponding acrylate. Phenyl acetoxysobutyrate was pyrolyzed at 450°C. to give a 90% yield of phenyl methacrylate. Hard-cast resins were obtained by polymerizing the above aryl acrylates. Phenyl methacrylate polymer resembles methyl methacrylate polymer in appearance. *o*-Allylphenyl acrylate polymerizes to an insoluble, infusible, cross-linked resin.

## Molding and Fabricating

**EXTRUSION OF NYLON.** C. P. Fortner. *Brit. Plastics* 21, 658-61 (Dec. 1949). The extrusion of superpolyamides is described briefly.

**ELECTRICAL REQUIREMENTS OF PLASTIC MOLDING MACHINES ARE TOUGH.** M. Morgan. *Electrical Manuf.* 44, 102-6, 188, 190. The types of electrical equipment used on plastic molding presses and some of their characteristics are described.

**MANUFACTURE OF P. V. C. COATED FABRIC.** *Brit. Plastics* 22, 20-5 (Jan. 1950). The spreading, calendering, and embossing techniques for coating fabric with polyvinyl chloride plastics are described.

**FLUID HEATING AND HIGH-TEMPERATURE COOLING FOR CALENDERS AND PRESSES.** P. L. Geiringer. *S.P.E. J.* 6, 9-12 (Jan. 1950). Fluid heating and cooling for plastic forming equipment are described. The advantages and disadvantages of this process are listed and compared with other forms of heating.

**ELECTROSOL—A DEVELOPMENT IN ELIMINATING ELECTROSTATIC ACCUMULATIONS IN PLASTICS.** M. J. Ainsworth. *S.P.E. J.* 5, 3-6 (Oct. 1949); 6, 12-16 (Jan. 1950). Electrostatic accumulations on plastics are prevented by the application of a special two-part coating.

## Applications

**THE PLASTIC BOTTLE.** Plastics (London) 14, 36-7 (Sept. 1949). Polyethylene bottles are used for cosmetics, baby feeding, talcum powder, acids, canteens, perfumes, and laboratory chemicals. Polystyrene bottles are used for chemicals

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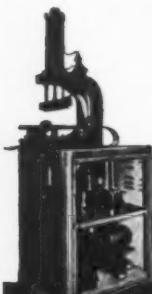
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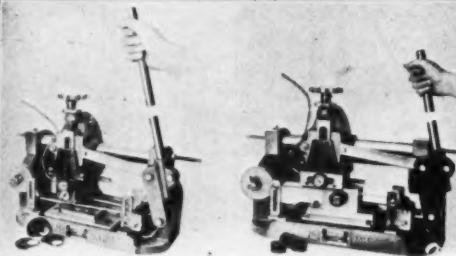
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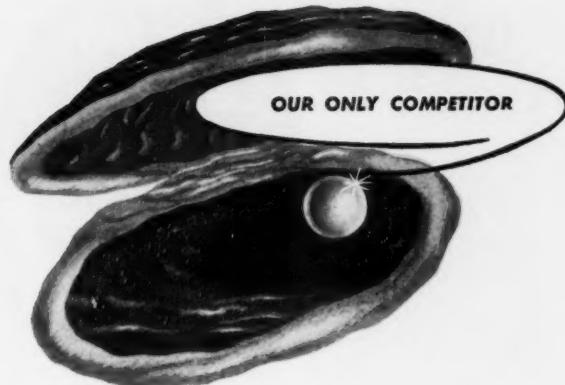
**P. V. C. CARRIERS FOR THE BISCUIT INDUSTRY.** Plastics (London) 14, 3-5 (Aug. 1949). Embossed belts of polyvinyl chloride plastic are used to mark candy bars and biscuits with trade names. Apparatus is described in detail.

**PRACTICAL FACTORS IN APPLYING INSULATING VARNISHES.** M. Kronstein. Electrical Manuf. 44, 96-101, 178, 180, 182, 184, 186, 188, 190 (Dec. 1949). The formulation, selection, and application of insulating varnishes are discussed in considerable detail.

#### Properties

**HEATS OF COMBUSTION OF POLYTHENE AND POLYISOBUTYLENE.** G. S. Parks and J. R. Mosley. J. Chem. Phys. 17, 691-4 (Aug. 1949). The heat of combustion at 25° C. of polyethylene is about 11,094 calories per gram and of polyisobutylene about 11,178 calories per gram. The results for polyethylene indicate that this polymer is crystalline at least to the extent of about 50% at 25° C. The results for polyisobutylene are abnormally high and can be explained on the basis of a steric interference effect within the molecules of this liquid polymer.

**IGNITION AND BURNING CHARACTERISTICS OF POLYESTER, PHENOLIC, AND MELAMINE FIBROUS GLASS LAMINATES.** H. J. Stark. A. S. T. M. Bull. No. 162, 55-8 (Dec. 1949). Results on ignition time and temperature and on burning time of melamine, phenolic, and polyester types of resins are compared from round-robin test data obtained at the Bureau of Mines and N. Y. Naval Shipyard laboratories. In addition, using results of data compiled at the National Bureau of Standards, the flash and self-ignition temperatures of these resins are compared. The conclusions reached concerning burning and ignition characteristics are: 1) Melamines have the greatest resistance to ignition and the shortest burning times; 2) Polyesters have the poorest resistance to ignition and the longest burning times; 3) Phenolics, having ignition and burning times between those of melamines and the polyesters, still



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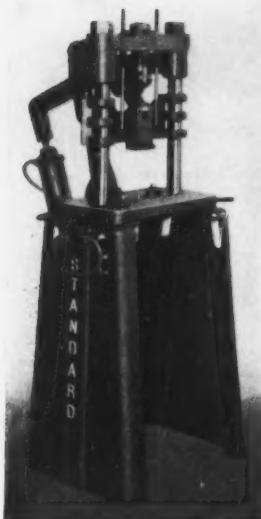
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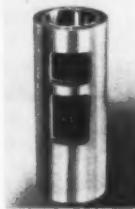
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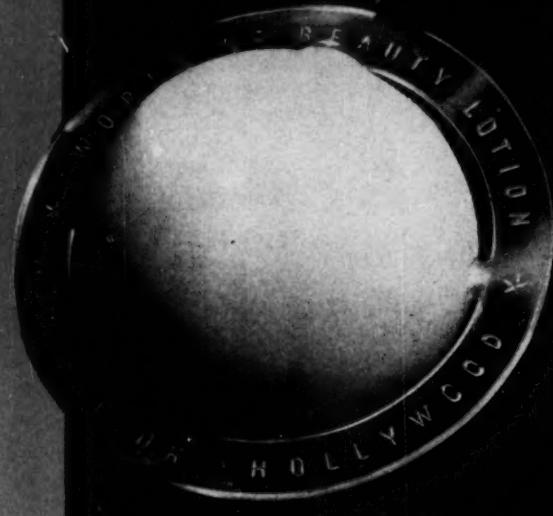
are much better than the polyesters; 4) Polyester resins for naval construction need to be improved greatly; 5) More basic work in future development of the low-pressure polyester laminates should aim to increase both their flame and heat resistance.

**EFFECT OF FUEL-IMMERSION ON LAMINATED PLASTICS.** W. A. Crouse, M. Carickhoff, and M. A. Fisher. Trans. A.S.M.E. 72, 175-88 (Feb. 1950). The effects of cyclic and of continuous immersion in heptane, toluene, and SR-6, a test fuel, on the weight, dimensions, and flexural properties of 19 samples of laminated plastics are reported. No one sample exhibited smaller changes than all other samples in all properties for all fuels, and for both cyclic and continuous immersion. The best weight and dimensional stability in the cyclic test was shown by a glass-fabric unsaturated-polyester laminate. The changes in flexural strength as well as in modulus of elasticity were losses in the majority of cases after the cyclic- and the continuous-immersion test. The unsaturated-polyester laminates varied widely among themselves in regard to the magnitude of the changes in a given property after an immersion test.

**CREEP BEHAVIOR OF PLASTICIZED POLYVINYL CHLORIDE.** M. D. Ali, H. M. Mark, and R. B. Mesrobian. Ind. Eng. Chem. 42, 484-8 (Mar. 1950). Studies on the creep behavior of vinyl chloride resin plasticized with liquid polymers derived from common vinyl monomers are reported. The various chemical factors that influence the formation of liquid vinyl polymers are described. In general, efficient chain transfer reagents such as carbon tetrabromide may be used successfully with the acrylate monomers to yield liquid polymers, whereas "degradative" chain reagents of the allyl type yield liquid polymers with a variety of vinyl polymers when used in copolymerizing systems. A number of the liquid polymers are compared, by tensile creep, with commercially used plasticizers; their plasticizing efficiency, under certain conditions of temperature and concentration, was found to be quite satisfactory.

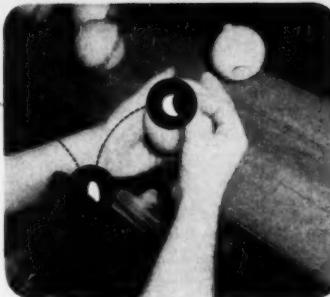
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# U. S. PLASTICS PATENTS

Copies of these patents are available from the U. S. Patent Office, Washington, D. C., at 25¢ each.

**POLYMERS.** S. A. Ballard, R. C. Morris, and J. L. Van Winkle (to Shell). U. S. 2,492,955, Jan. 3. A mixture of polyoxyalkylene copolymers.

**CELLULOSE ACETATE.** C. R. Fordyce and B. E. Bramkee (to Eastman). U. S. 2,492,977-8, Jan. 3. Casting solution of cellulose acetate, methylene chloride, an unsubstituted monoalcohol, and propylene chloride.

**STRUCTURAL MATERIAL.** G. B. Rheinfrank, Jr. U. S. 2,493,032, Jan. 3. Forming long cellular cellulose acetate bars, laying a strip of glass cloth coated with synthetic resin to cover two sides of the bar, building up an assembly of bars and cloth, cutting transversely, and curing with heat and pressure.

**STABILIZER.** H. L. Gerhart (to Pittsburgh Plate Glass). U. S. 2,493,343, Jan. 3. Copolymerizing styrene and an ester of endomethylene tetrahydrophthalic acid and triethylene glycol in the presence of a dissolved oxygen-containing gas.

**POLYMERS.** D. L. Schoene (to U. S. Rubber). U. S. 2,493,364, Jan. 3. Polymeric addition products of reactive methylenic compounds and sulfone-activated ethylenic compounds.

**CREASE-PROOFING.** L. Balassa (to U. S. Finishing). U. S. 2,493,381, Jan. 3. Crease-proofing textiles by applying aqueous thermopolymerizable resin and insolubilizing with an acid catalyst.

**STABILIZERS.** C. J. Chaban (to Stabelan Chemical). U. S. 2,493,390, Jan. 3. Halogenated vinyl polymers are stabilized with an ester of an oxyacid of phosphorus.

**POLYMER.** E. A. Kern (to G. E.). U. S. 2,493,584, Jan. 3. Increasing the heat-distortion point of a polymer of 2-vinyl dibenzofuran by dis-

solving in dioxan and hydrogenating in the presence of a catalyst.

**MOLDING.** R. W. Dinzl (to Watson-Stillman). U. S. 2,493,805, Jan. 10. Injection molding machine.

**COPOLYMERS.** R. E. Davies and A. R. Esterly (to Catalin). U. S. 2,493,948, Jan. 10. Mixing diallyl fumarate, styrene, and an organic peroxide, warming until shrinkage and thickening occur, and pouring into a casting mold and curing.

**POLYMERIZATION.** J. W. Haefele (to U. S. Rubber). U. S. 2,493,965, Jan. 10. Emulsion polymerization of styrene in the presence of a plasticizer.

**ACID-CURING RESIN.** W. Hull (to American Cyanamid). U. S. 2,494,095, Jan. 10. A polymerizable acid-curing thermosetting mixture of melamine-formaldehyde or urea-formaldehyde resin and endomethylene tetrahydrophthalic anhydride.

**TUBING.** V. F. Wigal (to Goodrich). U. S. 2,494,273, Jan. 10. Method for expanding preformed hardened thermoplastic tubing to a metastable heat-shrinkable condition.

**RESINS.** S. O. Greenlee (to Devco and Reynolds). U. S. 2,494,295, Jan. 10. Compositions comprising aldehyde-aryl sulfonamide resins containing active hydrogen and complex resinous epoxides which are polyether derivatives of polyhydric phenols.

**FORM.** F. J. Carlin (to U. S. Rubber). U. S. 2,494,329, Jan. 10. A metallic form for rubber having its rubber-contacting metallic surface coated with a mixture of resinous interpolymer of a styrene, a diallyc fumarate, an allyl alcohol, and a polymeric alkyl aryl silicone resin.

**VINYL CHLORIDE.** M. Naps (to Shell). U. S. 2,494,517, Jan. 10. Agitating and polymerizing liquid vinyl chloride in aqueous alcohol medium

in the presence of a peroxy catalyst and a methyl ether of a polysaccharide.

**ADHESIVE.** G. E. Babcock and A. K. Smith (to U. S.). U. S. 2,494,537, Jan. 17. Reacting resorcinol and formaldehyde in the presence of an acid, adjusting pH to 7.1 to 7.7, and mixing with corn gluten, alcohol, and formaldehyde.

**LIGNIN RESINS.** R. N. Evans and A. P. Ingrassia (to Masonite). U. S. 2,494,545, Jan. 17. Dissolving alkali-soluble lignin and partially polymerized furfuryl alcohol in a monoalkyl ether of ethylene glycol, diethylene glycol, or ether of diethylene glycol and tetrahydrofurfuryl alcohol, heating to react and partially polymerize, and removing the solvent.

**POLYMER TREATMENT.** W. H. Smyers and D. W. Young (to Standard Oil). U. S. 2,494,592, Jan. 17. Reacting a copolymer of aromatic olefin and aliphatic olefin with a compound of phosphorus and sulfur.

**CORRUGATING.** J. C. Case and L. S. Meyer (to L-O-F). U. S. 2,494,642, Jan. 17. Mold for corrugating resin-impregnated fabric.

**TWISTED STRIPS.** R. W. Canfield and R. B. Woodward (to Plax). U. S. 2,494,689, Jan. 17. Method and apparatus for producing twisted rods of thermoplastic material.

**CONDENSATES.** H. D. Hartough and J. J. Sardella (to Socony-Vacuum). U. S. 2,494,758, Jan. 17. Reacting aromatic hydrocarbons with formaldehyde in the absence of water and in the presence of glauconite.

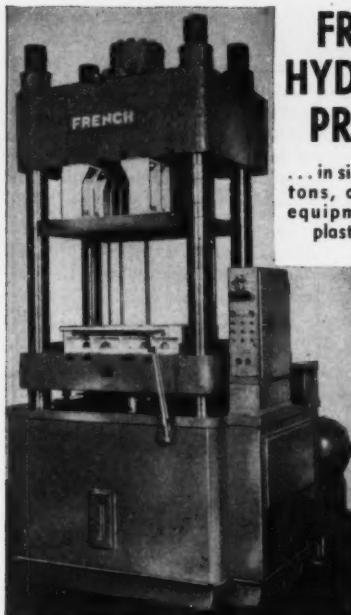
**MOLDING.** E. M. Patterson and F. R. McAloon (to U. S. Time Corp.). U. S. 2,494,777, Jan. 17. Injection mold with sprue severing means.

**POLYSILOXANES.** E. L. Warrick (to Corning Glass). U. S. 2,494,920, Jan. 17. Applying a mixture of toluene-soluble organopolysiloxane and an inorganic filler and curing.

**POLYMERIZATION.** J. L. Amos and K. E. Stober (to Dow). U. S. 2,494,924, Jan. 17. Mass polymerization of styrene in iron vessels.

**Die.** E. R. Wadleigh. U. S. 2,494,974, Jan. 17. Die for thermoplastics.

**POLISHING MACHINE.** E. Telenik. U. S. 2,495,036, Jan. 17. Machine for



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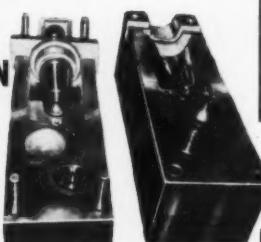
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**LAMINATE.** G. S. Willey and K. S. Ruthman (to U. S. Gypsum). U. S. 2,495,043, Jan. 17. Producing lignocellulosic hardboard from a number of mats of lignocellulosic fiber by contacting the surfaces with ferric sulfate, drying, and pressing.

**PHOSPHATE.** G. M. Kosolapoff (to Monsanto). U. S. 2,495,108, Jan. 17. The aryl phosphate of polyvinyl alcohol.

**WIRE ENAMELS.** C. B. Leape (to Westinghouse). U. S. 2,495,172, Jan. 17. Heating an unsaturated acidic material such as maleic or fumaric acid, adipic acid, and succinic acid with a primary diamine and a saturated glycol.

**RESISTOR.** L. Podolsky (to Sprague Electric). U. S. 2,495,199, Jan. 17. A flexible electrically-conductive composition of silicone resin and carbon and molybdenum sulfide dispersed therein.

**TREATING CELLULOSE.** N. Drisch and R. Fays (to Comptoir des Textiles Artificiels). U. S. 2,495,232-3-4-9, Jan. 24. Condensing in alkaline medium *p*-tert-*amyl*-phenol and formaldehyde and reacting with cellulose and subjecting the product to thermal treatment to form resin bridges between cellulose chains.

**POLYAMINES.** H. H. Hoehn (to Du Pont). U. S. 2,495,255, Jan. 24. The reaction product of the reductive-amination of a polymer of a mono-olefin and carbon monoxide.

**MOLD.** C. L. Milton, Jr. (to U. S.). U. S. 2,495,276, Jan. 24. Process for making multi-piece molds.

**THERMOSETTING COMPOSITION.** P. S. Pinkney (to Du Pont). U. S. 2,495,282, Jan. 24. Thermosetting composition of formaldehyde and the product obtained by heating a solution of mono-olefin-carbon-monoxide polymer, a basic compound, furfural, and formaldehyde.

**POLYAMINE.** J. H. Werntz (to Du Pont). U. S. 2,495,283, Jan. 24. Composition comprising a wax and a polymeric polyamine.

**POLYCYANOHYDRIN.** P. S. Pinkney (to Du Pont). U. S. 2,495,284, Jan. 24. A polycyanohydrin prepared by reacting in alkaline medium hydrogen cyanide and a mono-olefinic

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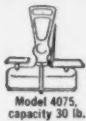
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## Tolerances In Molded Plastics

The word "exact" is almost non-existent in engineering parlance. The amount of variation from a given dimension which can be allowed and still permit that dimension to be acceptable in use is called the "tolerance" of that dimension. The smaller that tolerance is, the more expensive it is to make the part carrying that dimension. In plastic molding, the steel dies must be machined almost to perfection, which costs more and more as that perfection is approached. Temperature and timing in the molding must have super accurate controls. Materials must be carefully selected. All that costs the customer money.

All plastic molding compounds are organic in origin, and they all have basic and characteristic variations of shrinkage or set, from the mold to the cold piece. Sometimes that basic shrinkage will vary by as much as five thousandths of an inch from top to bottom of the barrel of raw material. Some allowances must be made for unavoidable variations in the molding—drafts, humidity, the tendency of the operator to stop and scratch himself at an inopportune moment.

Even the official shrinkage figures can become gremlins when the dimension passes over odd cross sections, thick and thin. The toughest problem a plastic engineer faces is to say exactly how closely he can hold a given dimension. It's always best practice to wait and see. The end product will tell the story. The customer should wait and adjust his assembly to the molded part wherever possible. Hardened steel dies are hard to alter.

Close tolerances are always expensive luxuries. If you must have them we will sweat it out, but the sweat will be there, and you will pay for it.

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hydrocarbon carbon monoxide polymer.

**COATINGS.** H. H. Hoehn (to Du Pont). U. S. 2,495,285, Jan. 24. Comprising a wax and a polymeric polyketone obtained by reacting ethylene with carbon monoxide.

**INTERPOLYMERS.** M. M. Brubaker (to Du Pont). U. S. 2,495,286, Jan. sulfide of a polymer of carbon monoxide with an unsaturated compound in the presence of a per-oxy catalyst.

**POLYTHIOLS.** S. L. Scott (to Du Pont). U. S. 2,495,293, Jan. 24. The reaction product of reductive thiolation with hydrogen and hydrogen sulfide of a polymer of carbon monoxide and a mono-olefin.

**CONDENSATES.** J. E. Bludworth and R. E. Meyer (to Celanese). U. S. 2,495,313, Jan. 24. Condensing acrolein with a monohydric saturated aliphatic alcohol in alkaline reaction medium in an oxygen-free gaseous mixture.

**SILOXANES.** A. J. Barry and J. W. Gilkey (to Dow Corning). U. S. 2,495,362-3, Jan. 24. Copolymeric siloxanes.

**INTERPOLYMER.** E. W. Kanning, E. G. Bobalek, and E. G. Hart (to Arco). U. S. 2,495,458, Jan. 24. A non-gelled resinous interpolymer of a monovinylaromatic compound with a drying oil, a polyhydric alcohol, and a polybasic organic acid.

**MOLDING.** I. E. Muskat (to Marco Chemicals). U. S. 2,495,640, Jan. 24. Molding resin-impregnated fibrous materials at low pressures.

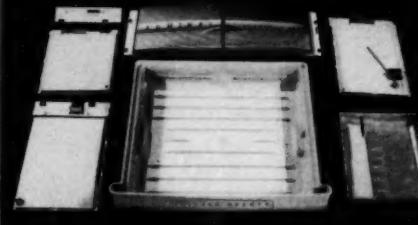
**PECTINATES.** H. S. Owens and H. Lotzkar (to U. S.). U. S. 2,495,757, Jan. 31. Artificial fiber of a polyvalent metal salt of a pectinic acid.

**CARBOXYMETHYLCELLULOSE.** J. D. Reid and G. C. Daul (to U. S.). U. S. 2,495,767, Jan. 31. Preparing a fiber by extruding aqueous carboxymethylcellulose salt into polyvalent metal salt solution.

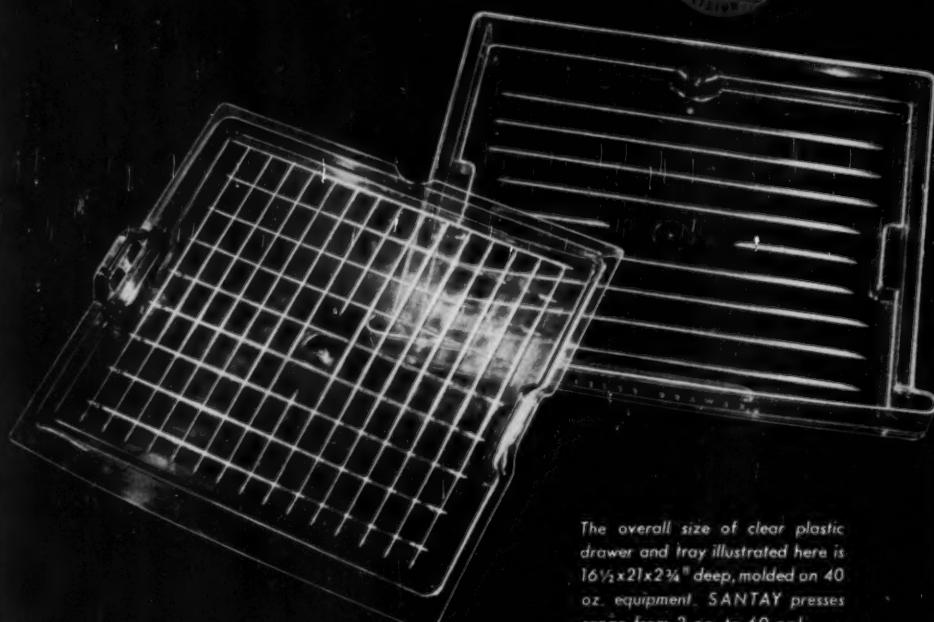
**TEXTILE SIZING.** G. D. Jefferson and R. D. Fine (to Atlas Powder). U. S. 2,495,845, Jan. 31. Textile size comprising water-soluble hydroxylic polyvinyl resin, boric acid, and water-insoluble wax.

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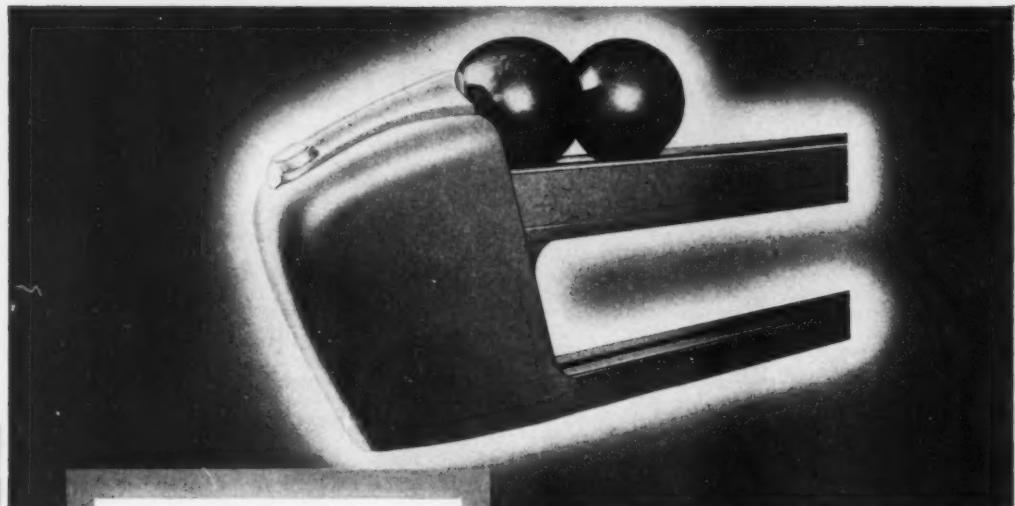
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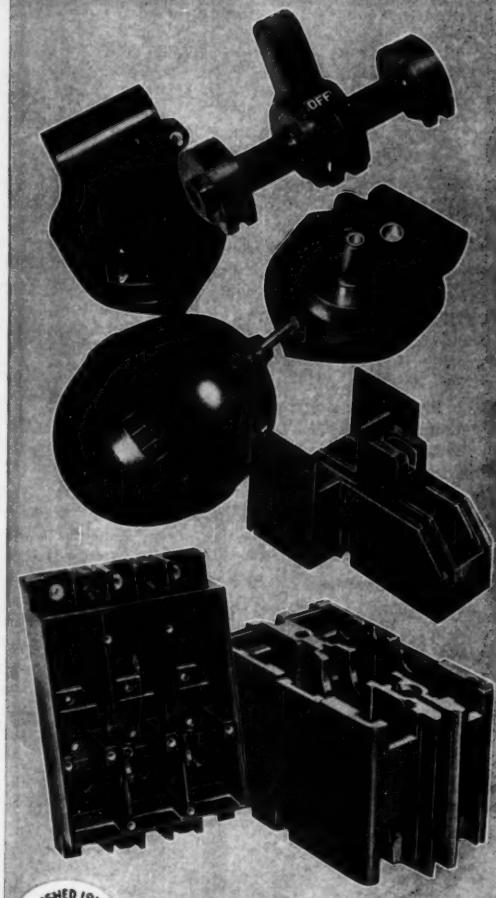
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# BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery.

## Industrial Chemistry, by E. Raymond Riegel.

Published by Reinhold Publishing Corp., 229 42nd St., New York, N. Y. Price \$7.00. 1918 pages.

Necessity being the mother of invention, the chemical industry has had to substitute synthetic goods for many of the natural materials which World War II cut off from our use. These new materials, along with methods for increased production, constitute the body of new information in this revised fifth edition. Treated here is the work done in the last decade with antibiotics, organic insecticides and fungicides, utilization of wood, new dye applications to fibers, atomic energy and recent developments in plastics and petroleum.

The fundamental principles of industrial chemistry are also redefined and discussed in the light of these new ideas and materials. Plants, equipment, machinery, materials and processes in over 50 chemical and process industries are covered, providing a total picture of the industry from the basic chemical reactions to the finished products, and making this an important reference book for chemical technologists.

## "Allyl Chloride and Other Allyl Halides."

Published by the Shell Chemical Corp., 800 Fifth Ave., New York, N. Y. 130 pages.

Prepared as a primary source of information on allyl chloride, fluoride, bromide, and iodide, this book combines a comprehensive review of published literature with previously unpublished data from the research and engineering staffs of Shell Development Co.

Over half the book is devoted to a discussion of allyl halide reactions, which are classified by type and include compounds formed by the independent or simultaneous reaction of the olefinic bond and the halogen atom. A description of physical properties includes infra-red and

ultra-violet spectra. Storage, handling, specifications and test procedures are outlined.

## "American Men of Science," edited by Jacques Cattell

Published by The Science Press, Lancaster, Pa. Price \$17.00. 2850 pages.

Biographical data on 50,000 men active in all fields of science are listed in this completely revised eighth edition. The directory, which has 18,000 more names than the previous edition, gives such information as subject of investigation, birth, educational background, and previous and present positions.

## "Market Guide for Latin America"

Published by the American Foreign Credit Underwriters Corp., 170 Broadway, New York 7, N. Y.

More than 95,000 individual buyers, manufacturers, dealers, distributors, and exporters in Latin America are listed in this fully revised 1950 edition. A trade classifier facilitates the selection of firms in all lines of business. Special features include a market survey of each country, with maps, distribution patterns and marketing centers, manufacturing industries, import and export figures, and revised patent and trade mark requirements.

**Plastic products and processes**—The second of the U. S. Dept. of Commerce's new product opportunity reports, this 69-page booklet lists representative patents available for plastic products and processes. It was prepared as a service to manufacturers and others interested in making and marketing new or additional products, and can be had for 25 cents. *Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.*

**Douglas fir plywood**—Information on the various plywood grades used in both interior and exterior construction is presented in this 20-

page, illustrated booklet. Also included are details on the physical properties of the material, plywood construction, and finishing. *Douglas Fir Plywood Association, Tacoma Building, Tacoma 2, Wash.*

**Electronic speed variator**—The features, advantages, operating characteristics, and ratings of this member of the firm's adjustable-speed drives are presented in this 8-page booklet, which lists both standard and optional features. *General Electric Co., Apparatus Dept., Schenectady, N. Y.*

**Fire hazard index**—Listing over 590 chemical, gas, and other fire-hazard materials, this pocket-sized, 36-page guide specifies which type of fire-fighting agent should be used on each, according to recommendations by the Board of Fire Underwriters and the National Fire Protection Association. The booklet also gives basic facts about the principles of fire-fighting. *Randolph Laboratories, Inc., 8 East Kinzie St., Chicago 11, Ill.*

**Silk screen printing supplies**—The company's entire line of supplies is presented in this 32-page booklet, which covers colors, paints, bases, powders, frames, hand-cutting films, brushes, tapes, tools, and accessories. *Advance Process Supply Co., 1402 W. Harrison St., Chicago 6, Ill.*

**Guides for the paint industry**—Recently issued were the following two technical guides for the paint industry: *Techni-Guide 517*, dealing with the use of Pliolite S-5 resin in exterior and concrete paints and giving formulation, preparation, and properties in detail; and *Bulletin C-102*, which discusses the introduction of Chemigum Latex 101, a synthetic latex, as a vehicle for water-thinned interior wall finishes. *Chemical Div., Goodyear Tire & Rubber Co., Akron, Ohio.*

**Kel-F: physical and mechanical properties**—*Technical Bulletin 1-12-49*—Charts and graphs illustrate the general and electrical properties of this thermoplastic. The text discusses specific characteristics such as resistance to chemical action, low cold flow, temperature, variable optical properties, and electrical and

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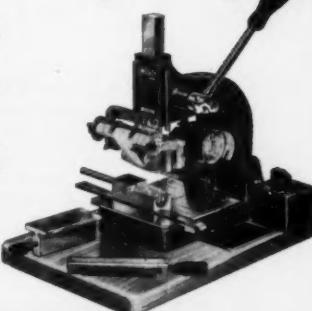
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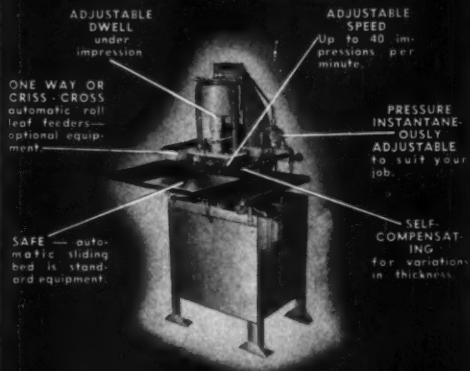
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moisture resistance. *M. W. Kellogg Co., P. O. Box 469, Jersey City 3, N. J.*

**Technical reports newsletter**—New bibliographies on creasing and water-repellency of textiles, prepared by the Army Quartermaster Corps as part of a textile research plan, are reported in the February issue of this series. These bibliographies contain descriptive summaries of principal papers on this subject as far back as 1937. *Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C.*

**Plastic moldings**—A pictorial tour through the molding section of this company's factory is the subject of this 38-page booklet. Accompanied by illustrations of products made, the publication covers materials; designing, making, and maintenance of the tools; and molding presses and finishing. *United Ebonite and Lorival, Ltd., Little Lever, Nr. Bolton, Lancs., England.*

**Bulk-handling systems**—Engineering assistance in planning bulk-handling systems for resin glues is offered in this booklet. A typical bulk handling layout is illustrated and the improved material handling and scheduling possible under the recommended system is discussed. *Plastics Div., Monsanto Chemical Co., Springfield, Mass.*

**Catalog of motion pictures**—Compiled in answer to requests for motion pictures of importance to industry, this catalog reflects the interest in general problems of business and management. Films are listed under such specific topics as consumers, distribution, efficiency, fire, forming and machining methods, human relations, machinery and equipment, plastic materials, and steel—its fabrication and production. *The Society of the Plastics Industry, Inc., 295 Madison Ave., New York 17, N. Y.*

**Computing return on invested capital**—A new method for computing potential return on capital invested by metal-working manufacturers is presented in this six-page booklet. The method starts with shop computations of annual savings effected by a new machine tool, and con-



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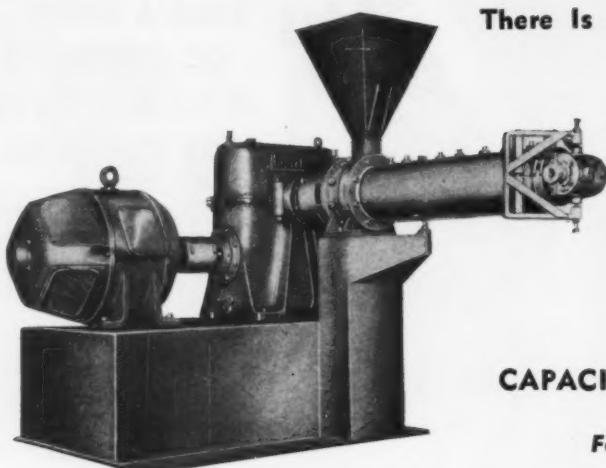
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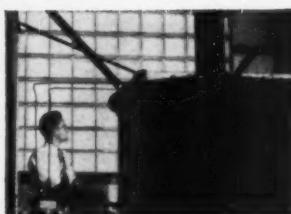
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tinues through the additional computations dealing with depreciation and Federal income taxes, in order to arrive at estimated net return over a 10-year period—the probable profitable life of the new machine. *National Machine Tool Builders' Assoc., 10525 Carnegie Ave., Cleveland 6, Ohio.*

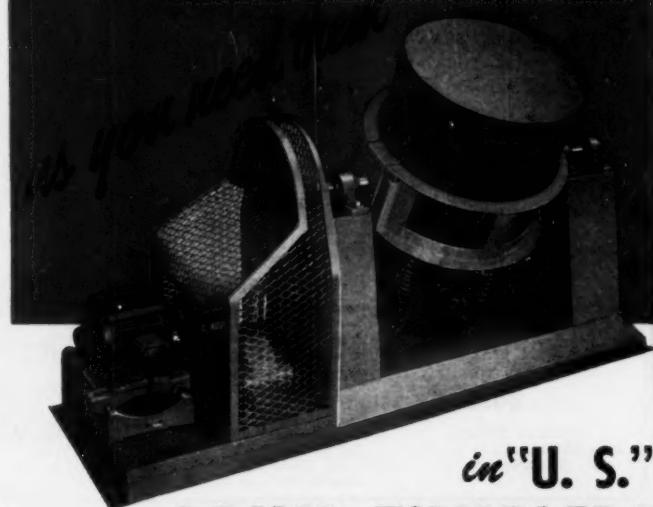
**Welding wall chart**—This illustrated chart, measuring nearly 2 by 3 ft., lists over 100 welding rods with their standard sizes. Also provided is technical data on types of joints, bonding temperatures, tensile strengths, Brinell hardness, electrical conductivity, resistance to corrosion, and flame adjustment. In addition, there is a section on the company's most important alloys and their properties, including the full range of low-temperature welding alloys. *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.*

**Chlorine handbook**—Designed to meet the demand for information on the safe handling and properties of chlorine, this 44-page booklet is presented in two sections. The general information covers the history and growth of the industry, characteristics of the element, chlorine containers, handling equipment and vaporizer, and first aid measures and gas masks. The second section, fully supplemented by tables and graphs, discusses the physical properties of chlorine and saturated chlorine, its vapor pressure, density, enthalpy, specific volume, solubility, and viscosity. *Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.*

**Tool catalog No. 102**—Tools used in drilling, reaming, and punching operations are listed and illustrated. Included are drills and reamers made of high speed, carbon, and cobalt steels, and tungsten carbide—and interchangeable punches made of carbon and high-speed steels. *Whitman & Barnes, 40600 Plymouth Rd., Plymouth, Mich.*

**Phenolic laminate data book**—Published as a working tool for the designer and user of industrial materials, this 36-page booklet presents the technical facts about Micarta, and includes the grades and

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forms in which it is supplied, together with the chemical, mechanical and electrical properties of each. Standard shapes and sizes are listed, together with a description of finishes. *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.*

**Laminated and molded thermosetting plastics**—This 30-page booklet will acquaint engineers and designers in industry with the properties of Dilecto and Celoron, the company's laminated thermosetting plastic. *Continental-Diamond Fibre Co., Newark 28, Del.*

**Technical data sheets**—Details on ammonia alum, potash alum, and aluminum sulfate brands manufactured by Peter Spence & Sons, Ltd., England, are contained in three recent releases by the U. S. distributor. *C. Tennant, Sons & Co., 350 Fifth Ave., New York 1, N. Y.*

**Polyvinyl acetate emulsions**—**Technical Bulletin P-16**—The theory of emulsions, properties, compounding, uses, and storage and handling are discussed here, along with recommended formulations for wood glue, book-binding adhesives, compounding adhesives, emulsion paints, and other applications. Nineteen explanatory charts, graphs, and illustrations accompany the 32-page text. *American Polymer Corp., 101 Foster St., Peabody, Mass.*

**Profits from plastics**—Testimony regarding the company's line of injection and compression machines are offered by 15 firms in this 16-page booklet. Illustrations and text tell of production experiences with refrigerators, telephone hand sets, wall tile, cash registers, and radio cabinets. These cases have been selected to show the unusual versatility of plastics and the manner in which the equipment met each individual production problem. *The Hydraulic Press Mfg. Co., 1010 Marion Rd., Mount Gilead, Ohio.*

**Esters**—Giving complete specification and application data on a large number of polyhydric alcohol fatty acid esters, this 24-page catalog is designed to help industry solve raw material problems and lower its manufacturing costs. *Glyco Products Co., Inc., 26 Court St., Brooklyn, N. Y.*

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What do you make?	Properties you need	DURITE recommends
Washing machine agitators.	Good impact strength, resistance to soap solutions and moisture.	DURITE: 745 Black or red.
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May • 1950

# DURITE

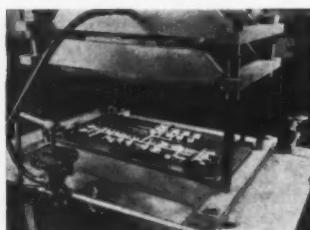
Molding Powders • Bonding Resins • Cements

## NEW MACHINERY AND EQUIPMENT

**TENSILE TESTER**—Testing many materials under varied load and speed conditions is made possible through the use of a new, high-precision electronic tensile testing instrument developed by Instron Engineering Corp., 2 Hancock St., Quincy 71, Mass. Among the accurate measuring and recording functions claimed for the device are: load-elongation properties of plastic films, coated materials, and laminates under tensile loading; hysteresis; relaxation effects; and tear testing of fabrics and plastics films.

Instron's Model TT-B tester utilizes a precision electronic weighing system for detecting and recording test loads. It features a pulling jaw operated by a drive which provides an absolutely controlled rate of sample elongation over a wide range of speeds and in either direction of travel. Features of the instrument include: jaw speeds from 0.02 to 20 in. per minute; load ranges from 2 gm. to 1000 lb.; and chart speeds of from 0.2 to 50 in. per min.

**DEGATER**—Aimed at providing greater efficiency in degating multiple-cavity shots on injection-molding machines is a new degating unit introduced by Lindex Corp., 208 E. 23rd St., New York 10, N. Y.



Designed to degate from 120 to 150 sprues (from any number of cavities) per hour, the air-operated unit makes clean cuts on all ma-

terials so that pieces need no finishing or deburring. In addition, different pieces on a sprue can be segregated automatically as they are degated. Other features of the equipment are: press opening height of 10 in.; a 12- by 24-in. bed which takes shots up to 10 $\frac{1}{4}$  by 23 in.; and a safety feature which requires the operator to use both hands.

**ELECTRIC SANDER-POLISHER**—Introduction of a new and larger electric sander-polisher, Model 2000, has been announced by Dremel Mfg. Co., 2409 18th St., Racine, Wis. The new unit, based on the same principle as the smaller machine made by the same company, is designed to meet heavier requirements.

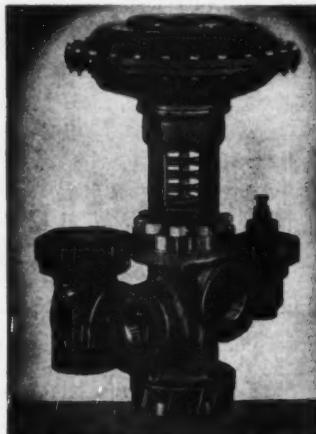
The latest addition to the Dremel line delivers 14,400 sanding strokes per min. using a straight-line, reciprocal-action principle which is claimed to prevent burning, scratching, or marring of sanded surfaces. Other specifications are: only two moving parts; oil-less bearings; light weight of 5 lb.; 21 sq. in. of sanding surface using abrasive No.  $\frac{1}{2}$  or finer; and a cam-type paper holder to permit rapid abrasive changing.

**DRUM TUMBLERS**—Smooth and even textures are said to be the results of blending or mixing powders or solutions on drum-tumble mixers manufactured by The United States Stoneware Co., 60 East 42nd St., New York 17, N. Y. A major advantage claimed for this "removable-drum" type equipment is the elimination of any danger of solution contamination. Stoneware builds its standard drum tumblers in sizes capable of handling one or two standard 55-gal. drums; models are equipped with variable speed drives permitting tumbling speeds ranging from 8 to 21 r.p.m.

In addition to standard units, the firm is prepared to supply special drums with removable heads, either

with or without built-in baffles, which can be used for dispersing dry colorants in crystal polystyrene. The tumblers are built of heavy plate with welded-steel construction permitting easy tumbling of loads up to 1000 lb. per drum. Standard power supply is a 1-hp., 220-volt, 60-cycle, 3-phase motor.

**HYDRAULIC VALVE**—Designed for use in controlling hydraulic cylinder operated machinery is a new and larger size two-pressure hydraulic



operating valve recently developed by Seely Instrument Co., Inc., 377 Fourth St., Niagara Falls, N. Y. The valve, designated as a 2 $\frac{1}{2}$  to 3-in. Series 805, is air pilot operated, which permits it to be applied to various automatic control devices. Composed of three units joined by nipples into one working unit, the valve is poppet type throughout, with all seats and disks of hardened stainless steel.

**MIXER-SCALE**—A scale designed mainly for compounding, mixing, and blending ingredients has been announced by Detecto Scales, Inc., 540 Park Ave., Brooklyn 5, N. Y. The new unit, equipped with a triple-beam assembly, is referred to as the Detecto-Gram Ingredient Batch Scale, Model 1745. Whereas the mixing of many ingredients previously required the use of several separate scales, it is claimed that these multiple operations can now be accomplished with the Model

# NEW!

# VAN DORN

## 2-ounce Injection Press



Utilizing the same rugged construction with doubled capacity, this Van Dorn press now offers you more profitable production with molding time reduced 30% to 50%. The new press has a larger heating cylinder with more plasticizing capacity; greater injection pressure; faster cycling due to larger motor and pump; and a unit for cooling hydraulic oil.

Surprisingly low in price, this versatile press

uses inexpensive molds, can be set up by one man in 20 minutes, and operates 8 hours for under 1 dollar!

With all these features, this remarkable press is unequalled in the 2-ounce capacity class for molding practically all thermoplastics, including nylon.

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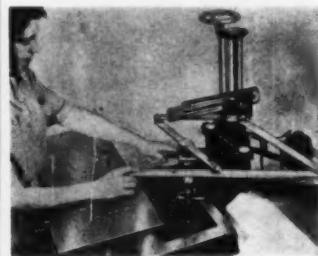
Here is the most versatile machine for any plant. . . So simple to operate by unskilled labor.

**NEW HERMES**  
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TRADE MARK

This heavy duty bench type model covers a larger engraving area than any other machine of its kind.

1745 scale alone. A special over- and under-weight indicator speeds up the weighing operation. The scale has a capacity of 200 lb., with graduations reading to 1 ounce. Additional features include a white enamel finish and an aluminum head.

**PLASTICS ENGRAVER**—To provide unskilled labor in the plastics field with an easy method of engraving and profiling, a new engraving machine, the Engravograph, has been announced by New Hermes, Inc., 13-19 University Pl., New York 3, N. Y. Available in both bench-type and portable models, the unit will engrave nameplates, signs, panels, and



other items by means of a simple tracer-guided principle. The machine is precision-designed with a tracing arm which allows the operator to change letter sizes at will. An automatic depth regulator insures uniformity of engraving.

**ELECTRIC MOTORS**—An improved line of gear-head electric motors, known as Slo-Speed motors, is currently being distributed by Sterling Electric Motors, Inc., 5401 Anaheim Telegraph Rd., Los Angeles 22, Calif. A feature of the new design is that the motors can be mounted in any position. Other claims include: weatherproof design; and higher efficiency due to an integrally built unit with helical gears, plus positive and reliable lubrication.

**POWER PRESS ASSEMBLY**—Hot stamping in color of molded plastic handles is claimed to be simplified by a new press assembly recently announced by The Acromark Co., 310 Morrell St., Elizabeth 4, N. J., for the firm's standard Series "A" power presses. Designed for hot stamping through colored tape or foil, the unit consists of a stamping head locked in a ram



## ***Versatile 'Perspex' acrylic sheet***

To make the most of the daylight, more than fifty sheets of corrugated 'Perspex' have been installed on the north side of Manchester Art School's temporary building. At night, 'Perspex' lighting fittings, made by Thorn Electrical Industries Ltd., London, provide efficient, evenly diffused lighting. These two examples of the use of 'Perspex' in the field of lighting are typical of thousands of others found for this versatile material throughout the world.

'Perspex', in corrugated form, or as lighting fittings fabricated from flat sheet, gives a 24-hour lighting service.

'Perspex' is the registered trade mark of the acrylic sheet manufactured by I.C.I.

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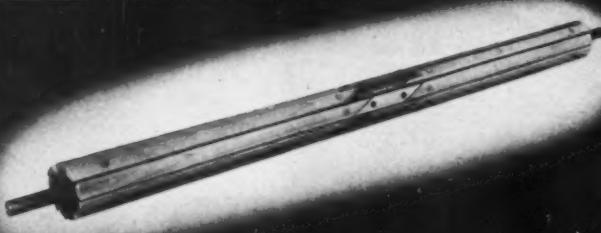


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Does your film wrinkle?

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Installed at strategic locations in your processing line, Progressive's Anti-Wrinkle Slat Expanders will keep your plastic film flat and free from wrinkles. They permit you to run your equipment faster, assure you of tighter, neater rolls.

Embossers, tubers, batchers and rewinds are a few of the processing machines that will operate better if film passes over a Progressive Expander before reaching them. An expander installed at the feed end of a printing machine and another placed at the delivery end, for instance, are good insurance of quality printing.

Slats are made of seasoned, polished wood. Progressive Slat Expanders come in standard widths from 24" to 120".

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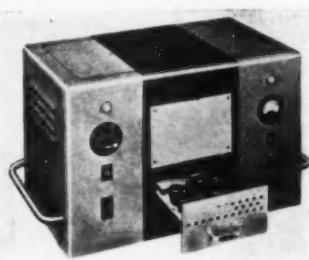
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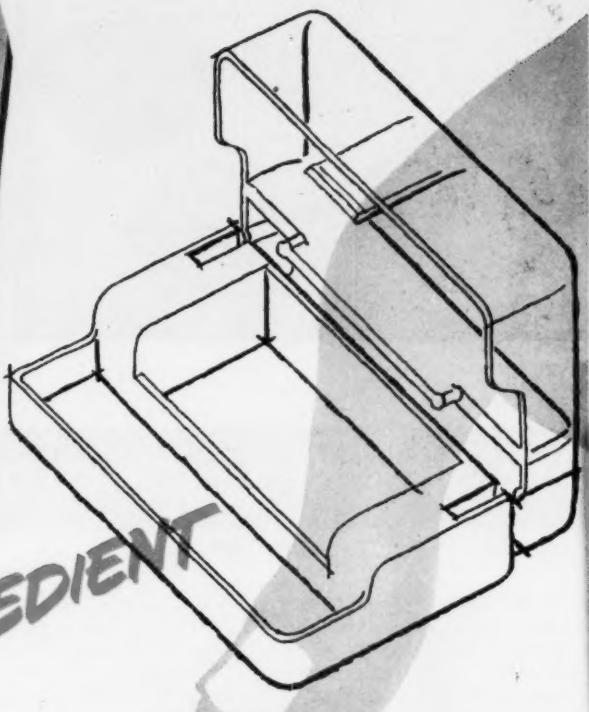
by means of a standard shank, and so constructed as to carry readily interchangeable lettering or design dies. To the head is attached an automatic tape feed unit to carry the colored foil underneath the die and to advance automatically at each ram stroke. A standard dial feed, located in the press bed, has 10 or more stations mounted on a floating-type holding fixture to carry the handles to be marked. The press is clutch controlled and set to operate at a feeding speed of 2800 marked handles or parts per hour. Heat is controlled by a thermostat; guards are provided where needed.

**PREFORM HEATER**—Rapid, uniform, economical, and thorough heating of plastics, rubbers, and other dielectric materials are the major claims for the new HFH 1.5 AH Dielectric Preform heater recently announced by The High Frequency Heating Co., 143 Glen Park Ave., Gary, Ind. A portable, automatic bench machine, the new unit is adaptable to preheating, drying, sealing, and processing. For preforming, one or several large or small "pills" are placed on a load-



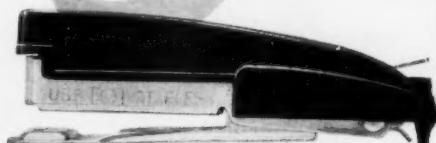
ing tray that slides into the heater. Heating is automatically started, and continues for the pre-set time cycle. The heater will raise the temperature of 1½ lb. of average material 170° in one minute. The loading tray is 6 by 8 in. and will accommodate material up to 3 in. high. Pills always come to the correct heating position because of the tray construction. High-frequency energy is provided at 40 mc. per sec., as a result of which, a wide range of materials can be heated. High-frequency also permits efficient heating at lower voltages. The heater can handle alternate loads of different sizes to serve two presses.





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Sales-wise packagers get dividends aplenty—from BAKELITE Styrene Plastics. Low cost, for example. And richer, clearer colors. And jewel-like fineness of detail.

Consider this stapler kit\* by Speed Products Company, Inc. It has made a sure-fire impulse-buy item out of the ingenious, useful little "Tot-50" Swingline Stapler. It's small enough to fit the palm of your hand—and a fine example of the beauty and utility of BAKELITE Styrene Plastics.

Note the transparent, water clear lid that lets the product sell itself...the contrasting color of the opaque base...the smooth lustrous finish. Remember BAKELITE Styrene Plastic is dimensionally stable. It has good mechanical strength, resistance to water and most chemicals, providing

packages of lasting usefulness. Add these qualities to ready moldability into complicated three dimensional shapes and fine detail and you have a material no alert packager can afford to overlook!

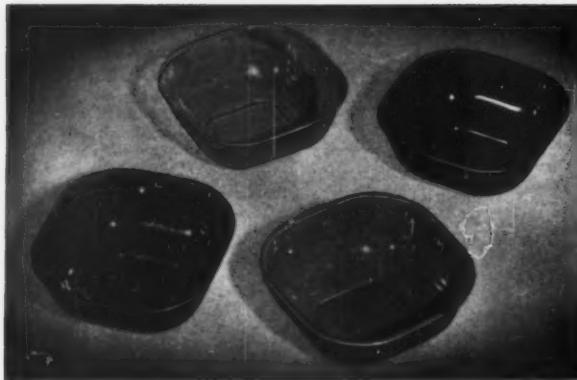
See how BAKELITE Styrene Plastics can add beauty, economy and selling power not only to your packaging but to your products, as well. Bakelite Division engineers will be glad to furnish information about applying them to your specific requirements. Write Dept. AF-13.

\*Molder: K & C Experimental Works, 106 Straight St., Paterson, N.J.

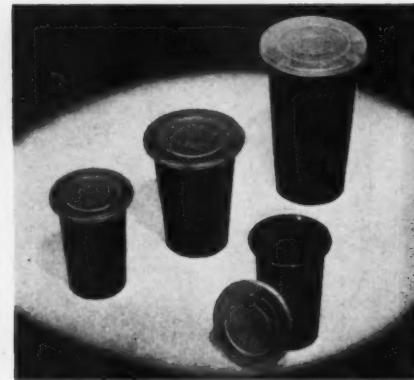
**Bakelite**  
TRADE-MARK  
**Styrene**  
PLASTICS



BAKELITE DIVISION, Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y.



A



B

## PLASTICS STOCK MOLDS\*

MAY, 1950

A—Utility bowls. Made of Lustrex polystyrene in crystal and a range of colors including red, yellow, cranberry, and frosted green. Measure 4½-in. square. Shipping weight is 14 lb. per gross.

B—Tumblers with lock-tight covers. Tumblers are made of polystyrene and are available in 5-oz., 9-oz., and 14-oz. sizes. Colors in the 5-oz. and 9-oz. sizes include red, green, yellow, and blue; in

the 14-oz. size, red, yellow, cranberry, and frosted green. Shipping weights are: 5-oz. size, 8½ lb. per gross; 9 oz., 14½ lb. per gross; and 14 oz., 4½ lb. per quarter gross.

C—Sure-grip, square-bottom tumblers. Made of polyethylene in 4-oz., 8-oz., and 14-oz. sizes. Produced in crystal and a range of pastels including pink, green, yellow, blue, and orange. Ship-

ping weights are: 4-oz. size, 6½ lb. per gross; 8 oz., 10 lb. per gross; 14 oz., 11½ lb. per half gross.

D—Ridged coasters made of polystyrene have apple-shape design. Available in fireglo, cranberry, red, yellow, and frosted green. Shipping weight is 4½ lb. per gross.

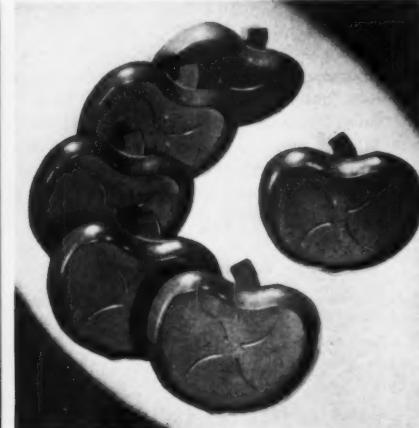
A, B, C & D are made by Rogers Plastic Corp., West Warren, Mass.

Molders are invited to submit samples of stock products to be described on this page as space permits. Address samples and detailed information to Stock Molds Editor, *Modern Plastics*, 122 E. 42nd St., New York 17, N. Y.

C



D



the new polymeric  
vinyl plasticizer  
**PARAPLEX G-60** is

- permanent
- low-cost
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# Production of

FOR THE purpose of this report, production is the sum of the quantities of materials produced for consumption in the producing plant, for transfer to other plants of the same company, and for sale. Sales include only the quantities involved in bona fide sales in which title passes to the purchaser.

The figures of sale given in the present report are not comparable with those for consumption in the producing plants plus shipments to other plants

Materials	Total Prod'n 1949	Total Sales 1949
<b>CELLULOSE PLASTIC:<sup>a</sup></b>		
Cellulose acetate and mixed ester plastics:		
Sheets, continuous:		
Under 0.003 gage	7,062,502	7,131,220
0.003 gage and over	7,787,386	7,470,974
All other sheets, rods and tubes	4,322,300	3,515,234
Molding and extrusion materials	55,888,602	53,662,098
Nitrocellulose		
Sheets	5,610,608	5,489,453
Rods and tubes	1,446,008	1,388,872
Other cellulose plastics <sup>b</sup>	8,518,882	7,437,990
<b>PHENOLIC AND OTHER TAR ACID RESINS:</b>		
Laminating	40,401,445	24,008,023
Adhesives	27,161,437	24,219,771
Molding materials <sup>c</sup>	131,083,719	117,394,312
Protective coatings (containing less than 10% modifier)	17,353,389	12,197,213
Miscellaneous uses, including casting	42,773,532	45,746,173
<b>UREA AND MELAMINE RESINS:</b>		
Adhesives	43,017,921	42,056,942
Textile- and paper-treating resins	30,054,913	23,590,491
Protective coatings, modified and unmodified	18,584,199	14,704,527
Miscellaneous uses, including laminating and molding <sup>d</sup>	48,523,972	43,771,615
<b>STYRENE AND STYRENE DERIVATIVE POLYMER AND COPOLYMER RESINS:</b>		
Molding materials <sup>e</sup>	183,884,041	179,356,061
Miscellaneous uses <sup>e</sup>	29,601,973	25,839,314
<b>VINYL RESINS:</b>		
Sheeting and film, including safety-glass sheeting <sup>f</sup>	157,545,346	156,708,601
Adhesive (resin content)	11,945,578	11,097,875
Textile- and paper-treating resins, including spreader and calendering types (resin content) <sup>f</sup>	29,472,595	29,654,431
Molding material (resin content)	81,842,161	78,915,275
Miscellaneous uses (resin content) <sup>f</sup>	17,550,090	9,857,436
<b>MISCELLANEOUS SYNTHETIC PLASTICS AND RESIN MATERIALS:</b>		
Molding materials <sup>g</sup>	44,235,922	37,438,602
Protective coatings <sup>g</sup>	51,477,726	50,805,880
All other uses <sup>g</sup>	157,979,455	153,960,844

<sup>a</sup> Includes fillers, plasticizers, and extenders. <sup>b</sup> Includes sheets, rods, and tubes, and molding and extrusion materials. <sup>c</sup> Data on resins for laminating and miscellaneous uses are on a dry basis; data on molding materials are on the basis of total weight. <sup>d</sup> Excludes data on protective coating resins; these data are included with miscellaneous coating resins to avoid disclosure of operations of individual companies.

# Plastics Materials

given in earlier reports. The figures for production given in the present report, however, would be comparable with figures for consumption in producing plants plus shipments given in earlier reports except for inventory changes. From month to month these changes in inventory may be substantial, but over several months it will be found that the figures for this category tend to even out.

December 1949		January 1950	
Production	Sales	Production	Sales
717,220	730,610	860,000	838,264
570,674	571,675	668,832	657,973
386,344	313,945	409,015	323,446
4,637,786	4,350,777	5,387,154	5,098,068
373,356	438,757	444,266	452,634
111,433	93,731	98,139	101,317
971,514	807,986	824,595	941,881
3,645,414	2,083,578	4,263,687	2,493,311
2,444,449 <sup>1</sup>	2,188,461 <sup>1</sup>	2,120,027	1,978,925
15,947,862 <sup>1</sup>	11,029,472 <sup>1</sup>	16,934,922	13,946,931
1,734,830 <sup>1</sup>	901,785 <sup>1</sup>	1,484,287	1,192,192
3,773,683 <sup>1</sup>	3,868,884 <sup>1</sup>	3,955,341	4,063,812
4,807,505	4,483,857	4,764,102	4,651,339
3,336,115	2,634,958	3,123,051	2,623,036
1,834,042	1,390,289	1,775,481	1,577,377
5,245,248 <sup>1</sup>	4,303,262 <sup>1</sup>	4,988,299	4,294,678
17,235,554	16,695,712	16,754,998	17,538,031
2,901,737	2,642,921	3,341,553	2,770,845
16,567,070	13,664,043	16,443,143	12,330,635
1,147,014	992,258	1,196,028	1,105,507
2,955,577	2,461,597	3,503,721	2,871,806
10,585,984	9,347,142	9,744,324	7,935,598
1,780,652	786,121	2,181,654	1,197,163
3,658,280	3,029,022	4,513,761	4,016,046
5,435,984	5,221,509	6,035,840	6,121,243
15,202,775	14,470,061	16,616,382	15,835,419

<sup>1</sup> Includes data for spreader and calendering type resins. <sup>2</sup> Includes data for acrylic, polyethylene, nylon, and other molding materials. <sup>3</sup> Includes data for coumarone-indene, petroleum, silicone, and other protective coating resins. <sup>4</sup> Includes data for acrylic, alkyd, coumarone-indene, nylon, petroleum, silicone, and other plastics and resins for miscellaneous uses. <sup>5</sup> Revised.

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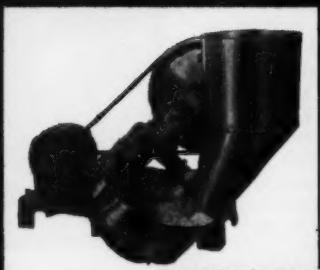
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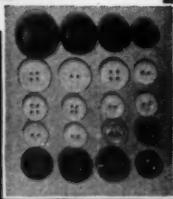
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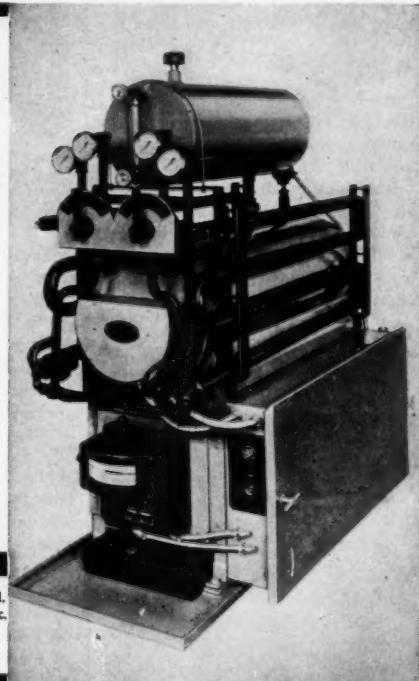
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COURTESY CELANENE CORP. OF AMERICA

**Cellulose acetate cup is weighted at bottom, rights itself if upset**

## Child's Cup

BABY'S tendency to tip over his cup has been dealt a formidable setback. A plastic cup, weighted in the bottom so as to right itself when upset, has been introduced by Westland Die & Engraving Co., Los Angeles, Calif.

Molded of tasteless, tough, chip-proof Lumarith acetate, the cup has a snap-on dish cover with small drinking and air holes which prevents messy spilling.

### Sanitary Protection

Aside from its tip-proof feature, the baby cup also affords additional sanitary protection, since the snap-on dish keeps inquisitive little fingers out of the container. This also serves to prevent wasting the contents. Further, because the cup is covered even when in use, foreign matter cannot enter it. A decal adorns the outside of the cup.

**Parts of plastic child's cup. At lower right is the snap-on cover**



## Jewel Displays

PLASTICS performed publicly in distinguished company recently when acrylic show cases were chosen as the display medium for an exhibition of the fabulous Harry Winston jewelry collection. In planning the showing as a benefit for the United Hospital Fund at the Rockefeller Center Forum in New York, display artist Tom Lee assigned to acrylic the task of protecting the group of precious stones, referred to collectively as "The Court of Jewels."

Just Plastics, Inc., New York, N. Y., prepared the cases, which were made up of Plexiglas acrylic sheet especially for the exhibit. One



COURTESY DUNN & BAER CO.

**Hanging display of acrylic globe halves housed Jonker diamond**



**Half-globes of acrylic formed wall cases to display and protect jewels**

Innovation in this use of acrylic was the hanging display for the Jonker diamond; it consisted of two globe halves held together with screws passing through a wooden flange and through the acrylic globe flanges at several places around its diameter, and suspended from the ceiling with thin wires which held the display at eye level. The back globe had an inside diameter of about 31 in., while the front part had an inside diameter of 24 in. The wooden flange was wide enough to hide an electric light at the bottom of the globe to illuminate the jewel.

To show off the Jonker diamond to its fullest advantage, the inside of the back globe was sprayed with a dark, glittering coating; attached

to the globe was a small, similarly treated stand which served as the point of display for the huge stone. The suspended globe was kept stationary by thin wires attached to it and to a hook in the floor. The wooden flange around the center was locked at the bottom, offering additional protection. Only adequate tools and time could disturb the construction of the display cases—and each was wired so that unauthorized tampering would set off an alarm.

### Wall Cases

Other jewels in the collection were exhibited in wall cases consisting of acrylic half-globes—some with an inside diameter of 31 in., and others with an inside diameter of 24 inches. These were fastened to a specially constructed partition with metal screws through a wooden flange and the half-globe flange.

Historic sketches and photographs of the famous jewels were enclosed behind glass; but the jewels themselves were entrusted to the more adequate protection provided by acrylic.

Other famed jewels in the Winston Court of Jewels Collection include the Hope Diamond; The Star of the East; Jonker Diamond Number One; the Dudley Necklace; the Inquisition Necklace; the Idol's Eye; the Indore Pear-Shapes; Mabel Boll's emerald-cut ring; an emerald-cut ring from the McLean estate; a marquise-cut ring; the world's largest gem-faceted sapphire; and the Austrian Diadem.



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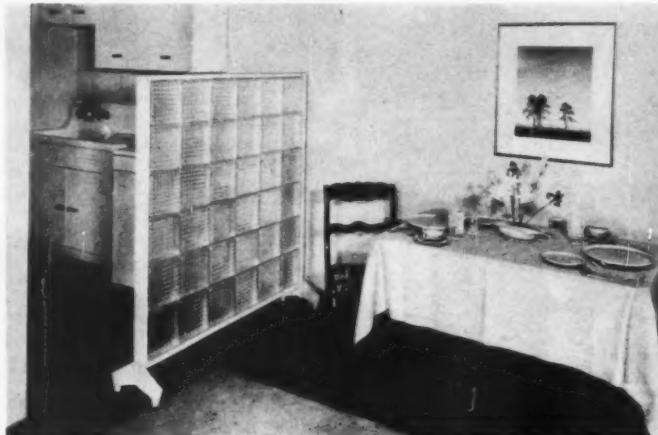


## Polystyrene Partition Blocks

DESTINED for building interior partitions, drop ceilings, displays, and other fittings in homes, offices, and stores is a new plastic block, Bloxolite, currently being distributed by the Bloxolite Co. of America, Pittsburgh, Pa. The partitions consist of two elements. The principal unit is a concave-ribbed polystyrene plate,  $\frac{1}{8}$  in. thick,  $7\frac{3}{4}$  in. square, and  $1\frac{1}{2}$  in. deep, molded of Dow Styron. Acting as the frame for the plates are grooved basswood lattice strips,  $\frac{1}{4}$  in. thick and  $1\frac{1}{2}$  in. wide, which are notched at 8-in. intervals. After the interlocking strips have been fitted to-

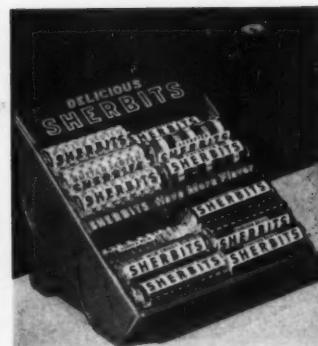
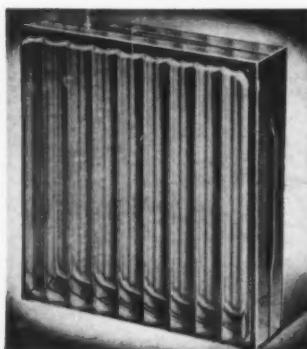
gether to form a framework of cells, the plastic half-blocks, each weighing slightly over  $\frac{1}{4}$  lb., are pressed by hand into slots located inside the cells.

The Styron blocks are molded by Lincoln Plastics Corp., Cambridge, Ohio, on a 12-oz. injection molding machine using a two-cavity mold operating on a 45-sec. cycle. Bloxolite can be produced in an unlimited range of colors, both in tints of clear material and in opaque, pastel shades. The blocks and strips retail for about \$1.80 per square foot; installation brings the total cost to about \$2.50 a square foot.



Polystyrene blocks can be assembled to form partitions for use in home. Translucent panels insure privacy, yet provide adequate light transmission

Left: Panels consist of plastic plates available in unlimited range of colors. Right: Blocks are formed by pressing half-blocks into frame of basswood strips



Polystyrene dispenser has lugs in bottom to keep candy in alignment

## Lozenge Dispenser

A NEW counter candy dispenser of molded polystyrene has been adopted by F & F Laboratories, Inc., Chicago, Ill., for its new line of Sherbits hard candies. Both Dow and Monsanto polystyrene have been used in the dispenser, a two-cavity job which is run on a 22-oz. press.

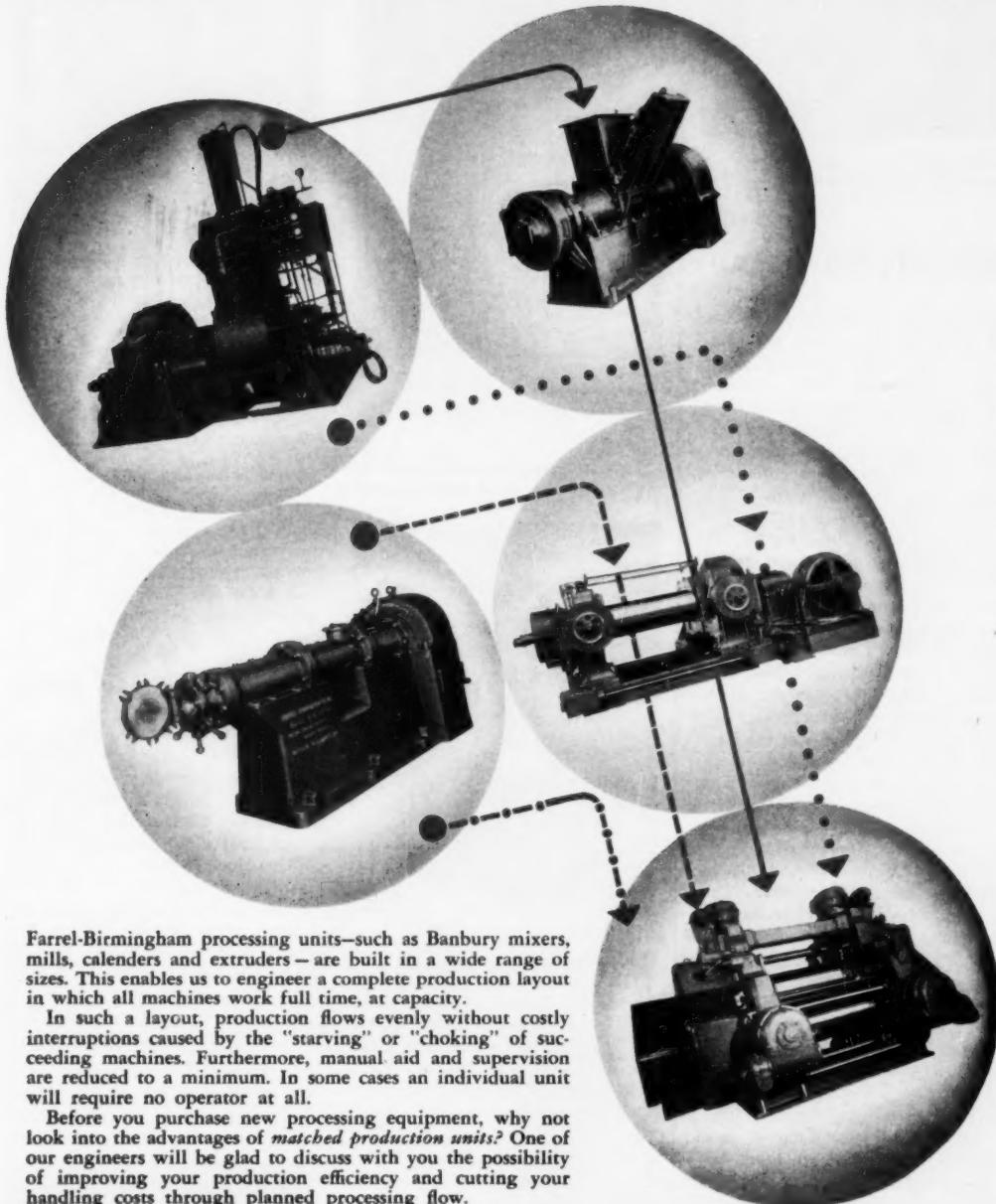
Lugs molded in the bottom of the plastic unit keep candy packages in alignment. White lettering on the front of the display is applied by hot stamping. The unit is molded and finished by Chicago Molded Products Corp.

The new dispenser replaces a larger wooden unit; polystyrene was chosen because of lower production costs, adaptability to compact construction, and bright colors.

Candy dispenser is two-cavity job. Lettering is applied by hot stamp



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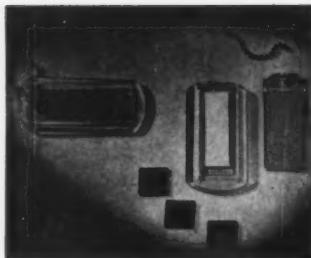
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Polystyrene letter or number squares fit into covered slot in tag

## Identifying Tags

**O**f constant concern to people who travel or frequently carry such articles as keys, umbrellas, golf bags, or brief-cases is the possibility of misplacing or losing these items. A measure of reassurance is afforded such people by the recent introduction of polystyrene identification tags which combine utility, light weight, and attractiveness.

Trade-named I-Dent-O, the tags are distributed by Wright Industries, Inc., Chicago, Ill. They are available to consumers in two main types: luggage tags and hotel key tags. The tags consist of a molded plastic piece with a slot into which can be placed three square plastic letter or number blocks giving either the initials of the owner or the number of his hotel room. The blocks are covered by a polystyrene strip which is pushed into the slot.

Both the luggage and key tags are molded of Koppers polystyrene by Bencar Mfg. Co., Addison, Ill., while the letter and number blocks are hot-stamped polystyrene produced by both Bencar and Rohden Mfg. Co., Chicago. Luggage tags are made in a red and gold combination, but the key tag may be obtained in either red or black with white or gold numbers.

Since the personalized blocks are square, the numbers or letters can be inserted either vertically or horizontally. Refill blocks may be purchased individually. An added feature provides space for complete name and address on the reverse side.

The I-Dent-O tags are being distributed nationally, and are being sold in point-of-sale displays.



Special promotion of soap products features polyethylene re-use bags

Multi-purpose plastic bags for soap items are made of 0.0015-in. film



**T**HE sales appeal of plastics is currently being exploited in a tie-in premium campaign being conducted by Lever Bros. for its soap products. Boxes of the firm's Lux, Swan, and Rinso soap items, wrapped in a re-usable, multi-purpose polyethylene bag, and having a total retail value of \$1.00, are being offered at a special promotion price of \$7.95.

A product of Preston Div., The Visking Corp., Terre Haute, Ind., the Visqueen film bags are said to be excellent for re-use as refrigerator containers and other related household purposes. The 0.0015-

## Refrigerator Bags



Tasteless, odorless bags can be re-used to wrap food in refrigerators

in. film has tasteless and odorless characteristics which make it particularly adaptable to food packaging. The Visqueen bags are supplied by Transparent Specialties Co., Cleveland, Ohio.

### Offered in Selected Markets

Merchandising plans call for conducting the premium package offer in communities having a population up to 250,000 people. Newspaper and radio promotion will back the offer in these test areas.

## Tool Handle Grip

**D**URABILITY, safety, and resistance to oil and grease are the major characteristics of a plastic handle grip which is being used on a crimping tool manufactured by Vaco Products Co., Chicago, Ill.

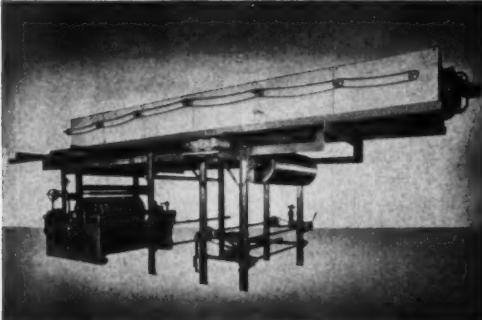
The tool handle is injection molded of elastomeric vinyl by Minnesota Plastics Corp., St. Paul, Minn., using Vinylite resin. The plastic material was chosen because it was found to be lower in cost than other materials, is easier to install on the crimping tool, and provides a comfortable grip for the hand during use.

Vinyl cover on tool handle resists grease, provides comfortable grip



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Sharp lip of styrene tooth paste cap cuts paste as squeezing stops

## Tooth Paste Cap

CONTROL of tooth paste flow and a safeguard against loss of caps are two consumer conveniences offered by a polystyrene tooth-paste tube cap introduced by Topper Cap Co. Div., Briley Bros., Inc., Detroit, Mich. Designed to fit most tooth paste tubes, the stopper dispenses paste when the tube is squeezed, and automatically halts the flow of paste when the pressure stops.

Manufactured of The Dow Chemical Co.'s Styron, because the plastic has low water absorption, and is stiff, yet elastic, the cap is produced for Briley by Maher, Inc., Worcester, Mass. In designing the stopper, it was first necessary to establish the proper thread and degree of taper in order to fit the

8

Plastic stopper, nationally marketed, is designed to fit most tubes



Illuminated house number parts are made of styrene and phenolic

PLASTICS are put to good uses in a combined illuminated house number and porch light manufactured by Ackerman Plastic Molding, Cleveland, Ohio, and distributed by Nu View House Number, Inc., of the same city. The device, which holds up to a four-digit house number, has a base plate molded of white polystyrene, number panels of 16-gage cellulose acetate sheet and a case of brown phenolic molded in a single piece. It measures 11 in. wide, 5 in. high, and 3 3/4 in. deep, and weighs 2 1/4 pounds.



COURTESY MONSANTO CHEMICAL CO.

Melamine-coated decorative paper is molded on wood-waste tray

## Decorated Molded Wood-Waste Tray

HIGH-chair trays for babies are being manufactured of decorated wood-waste in a single molding cycle by Pressed Wood Co., an affiliate of L. B. Ramsdell Co., Gardner, Mass. The durable tray is produced from ground and dried sawdust blended with a dry synthetic resin. The sawdust is ground so that it will pass through a 20-mesh screen and is dried to about 5% moisture content. A modified type of phenolic resin provided by Monsanto Chemical Co. comprises the bulk of the bonding agent. For different types of jobs requiring varying strengths, Ramsdell modifies the resin content accordingly.

For the surface coatings, different types of papers have been used to obtain the desired finish and appearance. These papers are generally impregnated with melamine and additives developed by the firm to achieve a flexible sheet.

Ramsdell's single-cycle molding operation runs about 5 min. at a temperature varying from 275 to 300° F., and pressure ranging from 1500 to 2000 p.s.i.

An important feature of the surface is that it has a permanent finish which cannot chip, peel, or rub off; rounded edges on tray provide baby with added safety factor.

Other plastic components in the chair include arms, wings, back, and cushion upholstered in vinyl.

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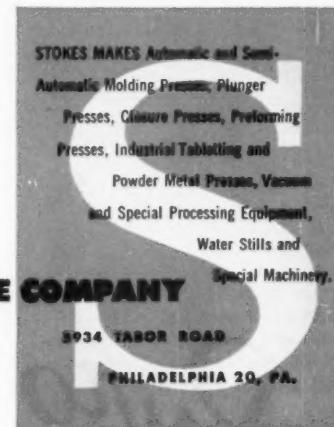
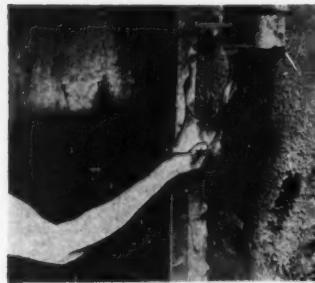




PHOTO COURTESY BAKELITE CO.

Coating of continuous vinyl film seals warehouse during fumigation



Plastic sealant, 0.005 in. thick, is easily stripped from walls, doors

## Vinyl Seal Coating

FUMIGATION of crop storage warehouses to destroy insects is said to be simplified at a savings in cost through use of a vinyl sealing coating previously used to protect military equipment from weather and rust. Using Vinylite resins as a base, the coatings are currently being employed in the fumigation of tobacco warehouses—and have demonstrated properties of rapid application and low maintenance cost.

The plastic coating is applied with a pressure spray gun and dries in a tough film that is resistant to weather, flame, and chemicals. A coating only 0.005 in. thick prevents fumigant gas from escaping from a sealed-in warehouse, but is not chemically affected by the fumigant. Spraying requires a minimum of untrained labor.

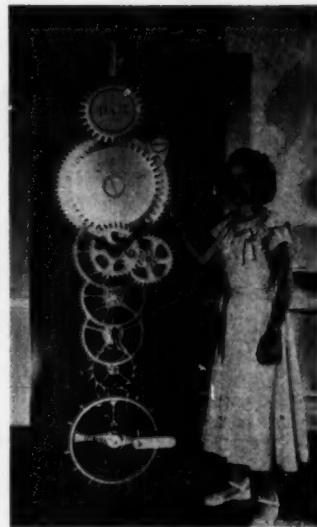
A continuous-film dry coating, the sealant consists of a combination of resins and solvents. Whereas conventional paper and mineral asphalt sealers normally require complete coverage of such areas as unbroken tile walls or closed fire doors, only the edges of these spaces need to be sealed when the plastic coating is employed. The vinyl-base sealing coating is said to retain its elasticity; at the same time it will not dry up or break off in the manner of conventional sealants. On the other hand, it can be easily stripped away, except at the point where a binder may have been applied first.

This adhesive binder is a special sealing treatment used to cover holes larger than  $\frac{1}{4}$  in. wide. The adhesive binder is first sprayed around the hole, after which a special webbing solution is sprayed over the hole until a filmy web has been established. This is then covered with the plastic coating for a continuous seal. Breaks larger than 18 in. can be sealed in the same manner after being segmented with pieces of tape.

The sealer can be sprayed on the outside of the storage place, or on the inside if precautions are taken to draw off the flammable fumes from the rapidly evaporating solvents in the material.

Agriculture Dept. experts believe the plastic coating requires less care than conventional sealers because elasticity and tensile strength enable it to wear well under the most adverse conditions. The coating is easily patched, since additional coats adhere to the original film without producing an unsightly appearance. At the same time, savings in labor have reduced the over-all cost of applying the vinyl sealing.

To seal holes, coating is sprayed on web formed over binder base



COURTESY BOME & HAAS CO.

Light-weight acrylic parts of watch movement enable it to keep time

## Watch Movement

ENJOYING top billing in a non-technical motion picture, "How a Watch Works," produced by Hamilton Watch Co., is a giant-sized watch movement built almost entirely of acrylic. To create this unusual working model, Hamilton chose light-weight Plexiglas, since metal or wood parts would have been too heavy in a model of this size which was designed actually to keep time; ease of machinability was another factor influencing the material choice.

Since the picture was filmed in full color, virtually all the train wheels and moving parts, fashioned from transparent acrylic, were painted with silver or gold.

For precision workmanship, the watch firm turned, naturally, to its own craftsmen who constructed a 7½-ft. model, or a unit about 50 times the normal dimensions of these watch parts. The model contains most of the elements of an actual watch, arranged in a line to illustrate the flow of power. Actual power for the model's operation is supplied by a 1-r.p.m. motor, and is relayed to a balance wheel whose rim was cut from a sheet of acrylic 1½ in. thick.

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Plastic coating on baby tender legs  
resists moisture, salt air, and oil



Plastic-coated metal tubing on legs  
has sliding solid wooden extensions

## Butyrate Legs on Baby Tender

GREATER scope for the activities of small children is afforded by a new combination chair and table play area which is supported on Tenite-coated legs. Known as the deluxe model Babee Tenda, the product is a development of The Babee-Tenda Corp., Cleveland 15, Ohio.

Constructed to permit quick, easy adjustment, the Extenda legs consist of square metal tubing coated with cellulose acetate butyrate to enhance the baby tender's appearance. Fitted inside the plastic-coated tubing are solid wooden extensions which slide up and down, permitting the combination unit to be heightened 5 inches. In its play-time stage, the table stands at a height

of 22½ inches. When elevated, it reaches within view of a normal dining-table level, enabling baby to join the family circle at meals.

The legs are strong and the decorative Tenite coating is virtually permanent. In addition, the washable plastic is resistant to moisture salt air, and oils. Color is matched to either the blonde or maple-finish table and cannot chip or peel. Samuel Moore & Co., Mantua, Ohio, makes the Tenite-coated metal tubing.

To raise the table, a push button, conveniently located on each leg, is pressed, releasing a spring which extends the leg automatically. A safety lock keeps the legs secure and steady at either level.

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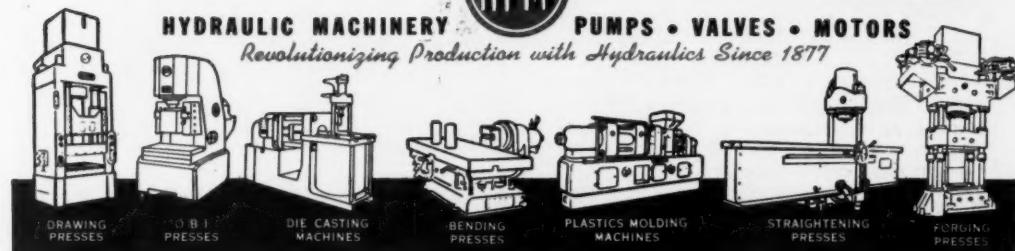
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## Pacific Coast S.P.I. Meeting

FACTORS influencing recent developments in the plastics industry were the underlying theme of the Seventh Annual Spring Conference of the Society of the Plastics Industry's Pacific Coast Section, held March 2-4 at the Hotel del Coronado, Coronado, Calif. In amplifying the various angles of this subject, speakers at the three main technical sessions emphasized the relationship between research, new markets, and the need for better methods.

Under the chairmanship of William F. Roberts, Monsanto Chemical Co., Los Angeles, Calif., the opening technical session, on the morning of March 2, got underway with an address on "Equipment for Large Injection Molding" by James S. Wilson, The Watson-Stillman Co., Roselle, N. J. Pointing out that producing large molds became the machine manufacturer's problem when materials suitable for large moldings appeared, Mr. Wilson declared: "Basically the machine and

the method of molding remain the same; however, refinements in automatic control, increase in clamping tonnage, and large capacity shots have, in these last few years, widened the scope of these machines from less than 1-oz. capacity to better than 200 oz. per shot."

Following Mr. Wilson, Sanford F. Glick, Monsanto Chemical Co., Springfield, Mass., discussed "Industrial Applications for Plastics," in which he outlined the reasons for the particularly rapid growth of styrene use.

At the March 2 afternoon technical gathering, supervised by W. Brandt Goldsworthy, Industrial Plastics Corp., Gardena, Calif., a particularly important analysis of "The Rigid Vinyls" was presented by George E. Field, B. F. Goodrich Chemical Co., Cleveland, Ohio. Approaching his subject with the statement that "polyvinyl chloride has been truly called the most versatile of plastics," Mr. Field went on to

pose the rhetorical question: "If vinyls are so good—why isn't more vinyl being used in the rigid applications?" His conclusions: ". . . the fault must lie with the producers and the users or fabricators of these materials . . ." and ". . . better than 50% of the responsibility rests on the doorstep of the plastic raw material manufacturers . . ."

Mr. Field expressed the opinion that problems of processability accounted for "99% of the reasons why more vinyl is not being used . . ." However, he continued, ". . . vinyls now on the market can be processed; it is only a matter of learning how . . ."

Discussing research efforts undertaken to improve processing methods, Mr. Field stated: ". . . our first attempt to develop good processing polymers containing no plasticizer were directed toward the use of vinylidene chloride as the comonomer, since we had more background in these types of copolymers . . ." With the aid of slides, he outlined the properties which may be obtained through use of this technique

(Continued on p. 157)

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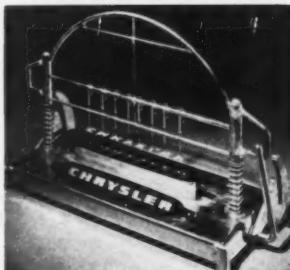
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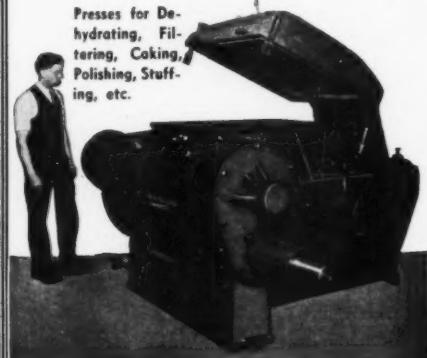
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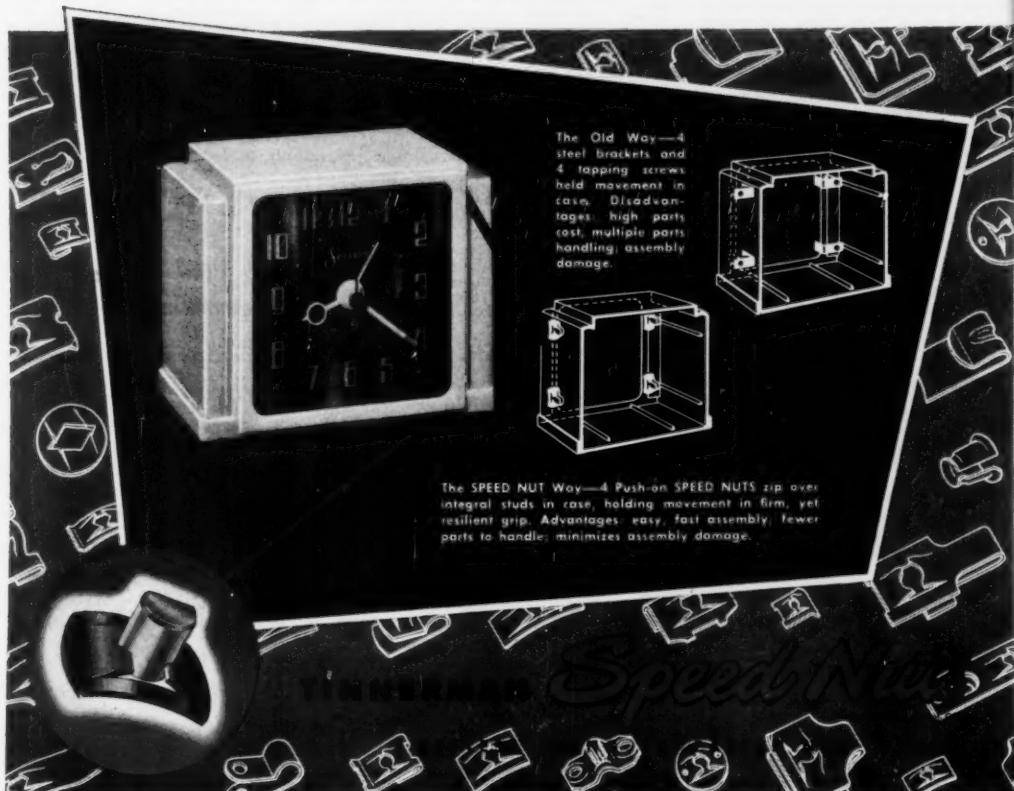
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Illustrated 24-page bulletin describing various grades of silicone rubber, giving technical data, some applications, and describing special adhesives for use with silicone rubber. General Electric Co. (5-601)

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Properties of Uformite CB-552 and Amberlite PR-115 and description of their use as adhesives bonded by means of high-frequency heat are presented in a 5-page release. Rohm & Hass Co. (5-602)

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Uses, properties, and list of applications for Plaxpax extruded polyethylene sheeting and lay-flat tubing. Plax Corp. (5-645)

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and the advantages they impart to products in which they are used.

A paper on "Alkyd Molding Material—An Accepted, Proved Plastic," prepared by Dr. Maurice H. Bigelow, technical director, Plaskon Div., Libbey-Owens-Ford Glass Co., Toledo, Ohio, was presented by Henry W. DeVore who declared: ". . . the new concept of compression molding (involving alkyd molding materials) . . . has been proved in an increasing number of applications . . ." and has produced three new commercial molding machines.

Speaking at the same session on "Preformed Low Pressure Molding in Reinforced Plastics," Sol M. Fingerhut, Zenith Plastics Co., Gardena, Calif., observed: "If the strength advantages of the long-fibered reinforcing materials are considered in combination with the molding qualities of the low pressure, polyester resins, large new markets appear open to the plastics industry. These possibilities have been apparent for several years, but material costs and inefficient processing have in the past prevented their full development. . . . How-

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The March 2 technical session also included an address on "Reinforcement for Reinforced Plastics" delivered by Clare E. Bacon, Owens-Corning Fiberglas Corp., Newark, Ohio.

Featuring the technical session held on the morning of March 3—for which the chairman was Richard G. Kress, Extruders, Inc., Culver City, Calif.—was a talk by James R. Turnbull, Monsanto Chemical Co., Springfield, Mass. After reviewing the changes that have occurred in the relationships between various components of the industry during the past three years, Mr. Turnbull

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went on to say that the major challenge confronting the plastics industry today is the ". . . problem of more value for fewer dollars . . ."

Other industry speakers participating in the three-day meeting, and their topics, were: William T. Cruse, executive vice president, S.P.I., New York, "Plastics Review and Preview;" Horace Gooch, Jr., president, S.P.I., Worcester, Mass., "1950—What It Means to the Plastics Industry;" and James D. McDonald, McDonald Mfg. Co., Los Angeles, Calif., "Tribute to Western Plastics Pioneers."

Contributing to a panel discussion on "Informative Labeling" at the March 3 technical session were: Amos L. Ruddock, The Dow Chemical Co., Midland, Mich., chairman; Frank G. Berlin, The Plas-Tex Corp., Los Angeles, Calif.; Gordon Brown, Bakelite Div., Union Carbide & Carbon Corp., New York, N. Y.; A. J. Carlson, Automatic Plastic Molding Co., Emeryville, Calif.; George H. Clark, The Formica Co., Cincinnati, Ohio; and L. R. Coombs, Lighting Specialties, Los Angeles, Calif.



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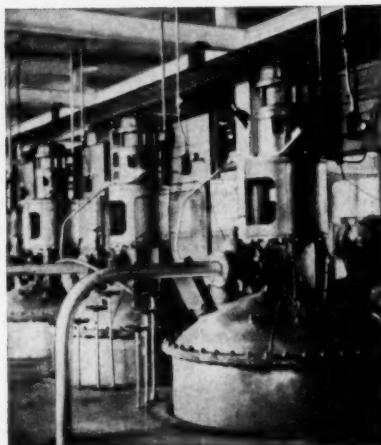
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THE British plastics industry faces a nation-wide shortage of phenol and there is some talk of this vital material being re-imported. This shortage is being reflected in a general tightening of phenolic resin supplies. At present there is no lack of cresylics and an adequate tonnage is available to the trade.

"Report on the Chemical Industry" just published by the Association of British Chemical Manufacturers gives interesting statistics relating to plastics production in Great Britain. In 1938 the annual tonnage had reached 30,000 tons; in 1946 it had increased to 80,000 tons. Output in 1948 was 130,000 tons. Present capacity is 185,000 tons and the ultimate capacity when the forward plans are completed will be 339,000 tons valued at £71,881,000.

An interesting and unusual use has been found for colored "Perspex" acrylic sheet for covering industrial sewing machine benches in large clothing factories. Advantages claimed include durability and freedom from splinters and cleanliness. Operatives appreciate the warmth to the touch of acrylic sheet surfaces, particularly as female workers in clothing factories have bare forearms and object strongly to any metallic material. Cream is a popular choice of color as this harmonizes with the machines and surroundings and helps to create pleasant working conditions. The Leeds firm of Spensley and Gough Ltd., has pioneered in developing this application.

A new heat sealer designed for the manufacture of bags and envelopes from polythene and other thermoplastic film materials is now on the British market. This is the Rediweld H.S.16 sealer which has a sealing cycle, including cooling time, of 2 sec.; a further second is required to move the film through the jaws which have a useful length of 16 in., permitting the sealing of fairly large bags in one operation.  
(Continued on p. 162)

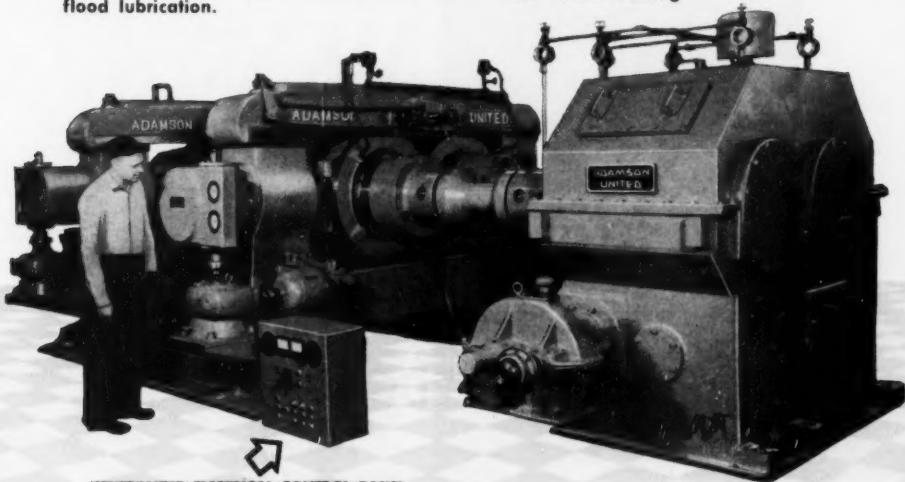
# A New Adamson United Horizontal Calender Designed especially for

## FLOOR TILE

This completely redesigned 30" x 54" two-roll, horizontal, floor tile calender, built for a leading manufacturer of flooring material, embodies the following features:

- Rolls—chilled cast iron, drilled type, supported in anti-friction, self-aligning roller bearings, flood lubricated.
- Connecting gears housed in separate pinion stand, running on fixed centers, with oil flood lubrication.

- Front roll driven by means of Mill-Type, Universal Coupling.
- Roll Adjustments—automatic type, driven by electric motors. Selsyns and counters continuously indicate exact position of front roll.
- Calender speed controllable over a wide range.
- Sight gages, valves and temperature indicators provided for controlling oil flow to each main bearing.



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FOR TANDEM ARRANGEMENT OF TWO CALENDERS

1. Speed Control and Indicator for Calender No. 1.
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5. Roll Gap Indicator—Left Adjusting Screw.
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Emergency Brake Control.
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Individual Operation.
9. Pinion Stand Lubrication Pump Controls.
10. Main Roll Bearing Lubrication Pump Controls.
11. Main Drive Motor Control.

Write for our new calender catalog.



Enlarged view of electrical control panel

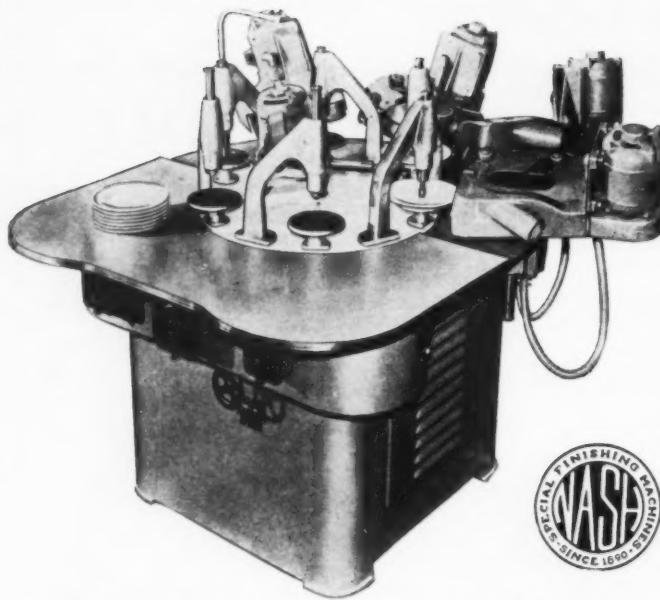
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On Plastic Dinnerware and Circular Mouldings

with the

## NASH 116 ROTARY EDGER

It's the modern way to remove flash from plastic dinnerware and circular moulded pieces. Gives you a perfect finish at the rate of 8 to 24 pieces per minute . . . on mouldings from 3" to 11" in diameter.

The proper combination of spindle speed and turntable speed (both easily adjustable) is determined by the amount of flash removal desired. Accurate control of the finished diameter is governed by the position at which you set the universally mounted abrasive belts.

### Rapid — Automatic — Accurate

Four high-speed abrasive belt units, universal in adjustment, do the work. They are mounted around the turntable which carries six spindles. Mouldings placed on the spindles then rotate, and as the turntable slowly revolves, are brought into contact with each abrasive belt in turn. The belts have progressively finer abrasives and are wax-impregnated to reduce harsh cutting action and prevent scratch lines. Final buffing belt produces polish on edge of dinnerware.

*Write us for engineering details  
and price data.*

### J. M. NASH COMPANY

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Milwaukee 10, Wis.

The heat sealer can, therefore, produce 20 welds per min., or 1200 welds per hour.

Claimed to be one of the largest acrylic shapings ever produced for the aircraft industry is the Radome for the Lincoln plane made by Thermo-Plastics, Ltd., Dunstable. The overall dimensions of the Radome are 9 ft. 6 in. by 6 ft. 6 in. by 3 ft. 3 in.; the shape embodies two double curvatures.

More orders are being taken for p.v.c. flooring. Indicative of the interest in this type of product is the news that the floor of the stand of British Plastics Federation at the British Industries Fair is to be laid with p.v.c. floor slabs made by De La Rue Co., Ltd. The Rotocure Continuous Process (Francis Shaw & Co., Ltd.) for making plastic flooring has been receiving a good deal of attention by the British manufacturers.

An entirely new application of polythene has been found in the injection molding of a miner's lamp battery case produced by Minerva Laboratories for Concordia Electric Safety Lamp Co. Excellent insulating properties combined with outstanding chemical inertness promise to make the polythene-protected lamp operate with much greater efficiency.

British plastics manufacturers, urged to increase dollar exports by the Board of Trade, are making every effort to meet American specifications so as to be in an advantageous position for offering tenders. The well known firm of Ashdowns, Ltd., has just announced it is now in a position to meet the American specifications for the production of glass-cloth and glass-cloth/cotton-cloth laminates for ducting, wall lining, and flooring of aircraft as well as many other purposes.

Significant is an increase in the British export of tricresyl phosphate to the continent. The plastics industries in France and Benelux countries are stepping up the production of most plastics, but particularly active has been polyvinyl chloride.

—John S. Trevor.

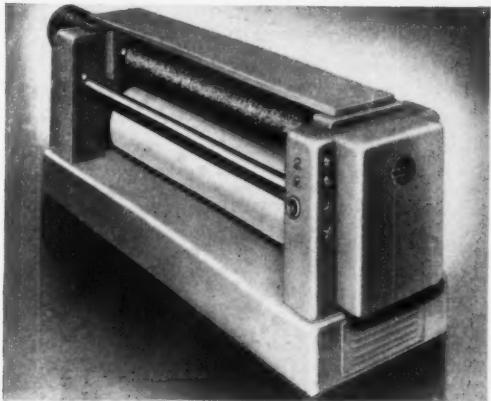
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May • 1950

## COOKIE CUTTING OR PRECISION MOLDING?



### Which do you want?

Precision molding requires accuracy—experience — engineering — high technical skill — complete "know how" to design your piece, work out your problems, produce your piece to your complete satisfaction.

On the other hand, cookie cutting — well!

**P L A S T I C M O L D I N G C O R P O R A T I O N**  
*Custom Molders · Precision Molders*  
Sandy Hook Connecticut

**Cold Mold • Hot Compression • Plunger  
Transfer • Injection**

## Canadian Plastics Conference

OBSErvATIONS by end users on the role of plastics in their respective fields were liberally sprinkled among the major addresses at the Eighth Annual Conference of the Society of the Plastics Industry (Canada) Inc., held Feb. 13 and 14 at the Royal York Hotel in Toronto, Canada.

L. C. MacLeod, Monsanto Canada Ltd., was re-elected as president of the organization. Other officers named were: Howard Yates, Crystal Glass & Plastics, Ltd., vice president; T. J. Carey, Canadian General Electric Co., treasurer; and G. Murray Scott, Dow Chemicals of Canada, councillor.

In his welcoming remarks at the opening session, Mr. MacLeod declared that a substantial increase in the volume of plastics materials converted into finished components for general manufacturing was the most significant trend in the industrial picture during 1949.

Mr. MacLeod was followed by

Earl Lifshey, managing editor, *Retailing Daily*, who offered the following suggestions for improving the plastics industry's relations with the public: "First of all . . . something must be done to simplify the terrifying terminology which one encounters in your business. . . Out of it all, we must find those common denominators of terminology and definition which will mean something definite and tangible, not only to the trade, but, eventually, to the consumer. . ."

"The second point . . . is the matter of establishing an adequate and satisfactory yardstick of standards for at least some of the major categories of plastics production. . . Finally, the third place where I believe there is room for lots of improvement is in far greater attention to informative labeling of finished products. . ."

There followed a comprehensive analysis of "Plastics for Packaging" presented by Miss Pearl Hagens,

managing editor of *Modern Packaging*, in which Miss Hagens pointed out ". . . the many avenues open to plastics for packaging. . ." accompanied by case histories of successful plastic packaging applications.

Prefacing her remarks with the statement: "As closely as anybody can estimate, plastics used for packaging already amount to more than 9% of the total 1,500 million lb. of synthetic resins now produced annually in the United States," Miss Hagens went on to trace the recent history of plastics in packaging. "Plastic packaging barely got started during the depression years—and of course everybody knows what happened during the war with its shortages. Only now—during the last three or four years—have material producers, molders, fabricators, and converters been able to perfect and market the many ideas that were just getting started in 1941. . . And that is good—because it is happening at a time when competition between packaged goods manufacturers is growing sharper. During such periods, they are avid for new tools that will help them



**NEW  
LABORATORY  
MILL**  
6" x 12" with Anti-Friction Bearings

THE laboratory mill illustrated above was expressly designed as a precision mill for operation at high temperature (650° F.).

A self contained lubrication system circulates oil through the roll journal bearings. The use of piston ring type oil seals eliminates oil leaks and the frequent replacement of rubber-based oil seals. Write for specification folder.

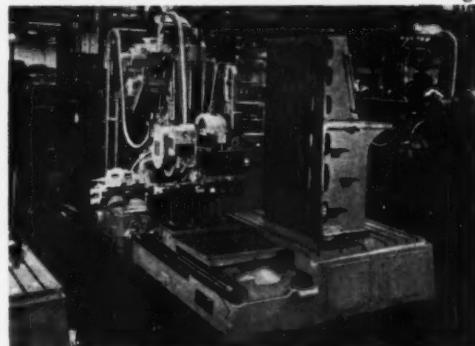
Capacity of mill: 2 to 3 pounds.  
Space required: 28" wide, 60" long.

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for every need . . . no matter how  
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uniform production of True Colors,  
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sell. Packaging is one of the most forceful selling tools. . . In selling plastic packaging . . . your success may depend—not on showing prospective users how packaging can save money—but how plastic packaging can *make* money for the manufacturer who adopts it. . .

" . . . Before there can be bold users of future plastics packaging, there must be courageous molders and fabricators who will seek out the users and convince them of the sales advantages of a new and untried package. . ." Miss Hagens concluded by prophesying that ". . . plastics for packaging will double, and triple their present volume during the next decade. . ."

Other speakers at the first session included Paul Clarke, The Aluminum Co. of Canada, Ltd., discussing "Gaining Market Acceptance of a New Product," and W. J. McCulloch, director of sales, Peller Brewing Co., Ltd., who addressed the Feb. 13 luncheon which was under the chairmanship of S.P.I. President Horace Gooch, Jr.

Leading off the afternoon session with a report on "Progress in the

Phenolic Industry," E. Borro, Durez Plastics & Chemicals, Inc., said: ". . . We have advanced beyond a dream in mold construction from the hammer and chisel days. . . The advancement in automatic molding in both the conventional upright as well as the rotary types of molding machines has been responsible for the reduction of labor costs resulting in opening up new and additional uses for phenolics, particularly in both the electrical and closure industries. . ."

Speaking next on "A Farm Implement Manufacturer Turns to Plastics," M. Gordon Coleman, Massey-Harris Co., Ltd., described what happened when a changeover to plastics was made without taking certain problems into consideration. Declared Mr. Coleman: ". . . Some of the limitations were: the carelessness of the average farmer; extreme exposure during all kinds of weather; abrasion of different types of soil; cleaning methods used by farmers. . ."

". . . Our reaction was to be critical of plastics. The above showed us we could not depend on the

plastics people to anticipate our needs. It showed the plastics people that considerable field work would have to be undertaken to introduce their products into this field."

Next on the program was S. E. Glick, Monsanto Chemical Co., who discussed "Highlights of Recent Injection Molding Development."

Speaking at the annual dinner on the evening of Feb. 13, J. R. Nicholson, executive vice president, Polymer Corp., Ltd., in his address, "Design for Plasti-Chemicals in Canada," described how a group of major industrial concerns merged their activities to permit the growth and progress of this phase of the plastics field.

Addressing the morning session on Feb. 14 were the following speakers and their subjects: D. J. Sloan, Lester Engineering Co., "Today's Injection Molding Equipment;" A. R. Olsen, Hercules Powder Co., "Design for Plastic Sales;" and M. A. Nichols, Manco Products Co., "Molds: The Use of Beryllium Copper." The two-day conclave was concluded with the annual general meeting.

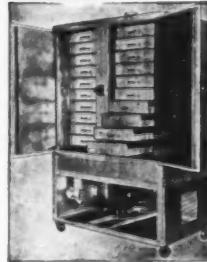
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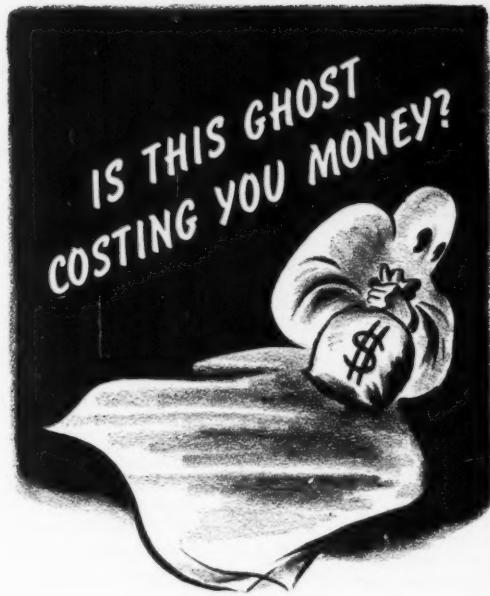
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These products have been thoroughly customer-tested for stability and printing quality under all conditions. The Atlas laboratories are at your service for solving your plastic printing ink problems.

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May • 1950

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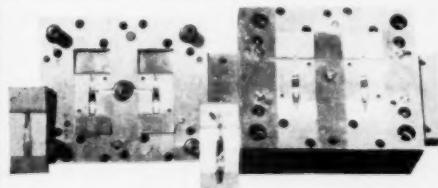
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Shown below is a photo of a mold (and pattern) recently made by the CRAIN-AMBROSE Process. This unusual mold, having such irregular parting lines, is not only difficult to produce by conventional methods, but would prove quite expensive.



... with the CRAIN-AMBROSE Process it was produced from an inexpensive pattern, conserving every minute detail, and you can NOW get this quality work for only \$27.50 per component.

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167

# THE PLASTISCOPE\*

NEWS AND INTERPRETATIONS OF THE NEWS

By R. L. Van Boskirk.

## Increased Versatility

BY THE addition of three new materials announced at the National Plastics Exposition in Chicago, B. F. Goodrich Chemical Co., has added considerable versatility to its line of polyvinyl resins.

A new polyvinyl chloride resin for rigid molding, called Geon 400 X 65, can be extruded, calendered, or molded in unplasticized form and at temperatures under 300° F. According to G. A. Fowles, sales manager, plastic materials branch, rigid vinyls have been enjoying less than 1% of the total potential market. Mr. Fowles stated that the high bulk density of 400 X 65 Geon allows up to 30% higher loading per batch in Banbury mixing than in conventional resins. He also asserted that the material's excellent heat stability for long periods makes it possible to use this resin for transparent molding as well as for calendering and extrusion compounds, crystal clear rigid sheet or piping, and low viscosity cements.

The second new material announced by Goodrich was a soluble vinyl resin offering economies in the field of solution-applied coatings. Designated 200 X 20, the product is a vinyl vinylidene chloride copolymer which is soluble directly in toluene, xylene, and high aromatic naphthas. Solutions ranging up to 50% solid content can be prepared readily with this material. Films made from 200 X 20 adhere well to a variety of surfaces including aluminum, copper, lead, tin plate, and steel if baked adequately. Films cast from solutions of this resin possess sufficient flexibility for most applications and can be plasticized for additional flexibility. The new product lends itself readily to application by any of the conventional techniques such as brushing, spray-

ing, or roller, knife, or bar coating. This solution coating is recommended for heat sealing coatings on paper, metallic foil, and cellophane; decorative coatings on paper such as labels, catalog covers, etc.; fabric anchor coats; fireproof coatings for window shade cloth; functional coats on non-woven fabrics, and flame-resistant coats for tents.

The third Goodrich product is a brand new plasticizer—an odorless, diethyl adipate. The new plasticizer is clear, completely odor free, has a low acid content, and has been specifically designed to provide low temperature properties to vinyl and other synthetic resin compounds. It is unusual, according to J. R. Hoover, vice president in charge of sales, in that it is odorless and yet will withstand temperatures as low as -70° without becoming brittle, while many other low-temperature plasticizers have an objectionable odor and the most commonly used ones tend to become brittle in the -40° range. Called GP 233, diethyl adipate may be used singly or may be blended with other plasticizers for use in all of the conventional processing techniques including calendering, extrusion, and molding. It is particularly applicable in organosol and plasti-sol formulations where laboratory tests have shown that in paste resin compounding, the new plasticizer forms a paste of low viscosity which is heat stable at processing temperature and yet imparts to finished products excellent low temperature properties.

## Anniversary

A 30-year anniversary party in observance of its founding on St. Patrick's Day, March 17, 1920, was held by Mack Molding Co. About 250 guests attended the gathering.

Established by Kenneth W. Mack-

sey and Donald S. Kendall in 1920 for the purpose of molding practically unknown materials such as Bakelite and Condensite, the company set up in business in a garage loft in Little Falls, N. J. Its equipment consisted of three small second-hand presses. Sidney I. Howell and James McIntosh joined later, and all four are now owners and operators of the plant. During the 20's the company expanded from the loft to the entire garage to a blacksmith shop; it then moved to Wayne, N. J., in 1929 where the plant is now located in shops comprising 120,000 sq. ft. of floor space in buildings that spread over 23 acres. During the 30's the company established branches in Waterloo, Quebec, Canada, and Arlington, Vt.

Today Mack Molding Co. employs 900 persons, is one of the oldest in the business, and is generally considered one of the leading plastics molding plants in North America.

## Plasticizer

SEVERAL vinyl processors have been telling us recently about their discovery and successful use of the comparatively new Hercules plasticizer called Hercosflex 150. The particular qualities they seem to like about it are the properties of low-temperature flexibility, color, and unusually low volatility—all in one monomeric plasticizer.

The plasticizer is manufactured from a blend of alcohols specifically chosen for the job. The mixture is about two-thirds normal octyl alcohol and one-third normal decyl alcohol, both obtained by hydrogenolysis of coconut oil. Raw material supplies are limited and consequently production is reported to be limited to something like 500,000 lb. per month. It is a very low-acid number liquid ester possessing excellent vinyl compatibility and plasticizing efficiency. It has a very mild and pleasant odor, which is a distinguishing characteristic of straight chain alcohol esters.

The properties of permanence, minimum migration tendencies, and good heat and light stability are making this plasticizer particularly useful in calendered sheeting, especially upholstery grades. Lower brittle points contributed by Hercosflex 150 have led to its use in luggage fabrics, while this property

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For many heating and pre-heating operations requiring wide range of accurately controlled temperatures . . . Surface plate is highly polished steel—no plating to flake off. Leveling feet. Rectangular shapes in almost any size to order. Controls for temperatures up to 550° F, 3—heat snap switches for 550° to 580°.

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The 2 ounce Hydraulic Minijector provides topnotch, big machine performance. It is the last word in compact, efficient molding machine design. Really engineered for production.

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- Maximum Injection Pressure — 16250 lbs. per square inch
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INQUIRE ABOUT  
3/4 OUNCE HYDRAULIC MINIJECTOR  
3/4 OUNCE HAND OPERATED MINIJECTOR

Small custom moldings, color chips, samples, tensile and compression bars are economically produced on these low-cost MINIJECTORS. They feature demountable, interchangeable cylinder and heater units which permit change of materials and colors in only 3 minutes. Write for details.

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# PLASTISCOPE

and its extremely low volatility and good electrical characteristics have led to its use in vinyl insulation.

## WPB Alumni

NEXT meeting of the former members of the Chemical Bureau of the War Production Board will be held at the Lexington Hotel in New York City the evening of May 17. No program . . . no speakers . . . no business are on the schedule—just a get-together, say committee members, who urge that all members of the chemical and plastics industry who became Washington habitués during the war come in and compare notes.

## S.P.E. Local Officers

THE last Thursday of each month has been set as regular meeting date of the Golden Gate Section of the S.P.E. At the last meeting, the following officers were elected: Clark Robinson, president; Vern Rawlins, vice president; and John C. Robb, secretary.

## Plastics at Princeton

PERFECTION of a new series of polyurethane plastics varying from hard to soft, rubbery compounds was announced recently by Prof. Louis F. Rahm, director of the Plastics Laboratories of Princeton University. These easily prepared castor-oil-di-isocyanate plastics show great versatility.

These materials were developed at Princeton through plastics research sponsored by the Army, Navy, and Air Force. In consideration of the Signal Corps Engineering Laboratories the new plastics will henceforth be called Scelite.

Another development at Princeton is a low-loss, arc-resistant paper laminate for high frequency applications. A report prepared by the Plastics Laboratory of Princeton under joint sponsorship of the National Defense agencies deals with modifying standard melamine-for-

maldehyde impregnating resin with varying amounts of hexamethylene-diamine to produce a laminated material with high dielectric strength, low dielectric loss, and good punching characteristics. The report describes the preparation of the laminate, its impregnation and drying, flow and volatile tests, and molding techniques. The complete report—PB 99220, Low-loss Arc-resistant Paper Laminates—sells for 50¢. Orders should be addressed to the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C., and should be accompanied by check or money order payable to the Treasurer of the United States.

## Precision Casting

DEVELOPMENT of a new plastic for use in precision casting, called ARD Lustrex 15K, has been announced by the A.R.D. Corp., 70 Pine St., New York 5, N. Y. It can be molded in cast molds that cost no more than wax-mold equipment. Because it can be molded at the low pressure usually available in any wax-molding machine, no equipment expense need be incurred in switching over. It is said to have good strength, rigidity, and stability properties.

## Specialty Monomers

A NEW company called the American Monomer Co., 262 Washington St., Boston, Mass., has recently been organized to manufacture specialty monomers of importance to the plastics industry but for which there is not sufficient demand for large-scale manufacture.

An example of the need for such service is the case of a company which wanted a few hundred grams of allyl fumarate. This was not available in the market, so the company was forced to make its own at a cost of several hundred dollars and a month's delay. If this experiment works out favorably, there will be a need for several tons of allyl

fumarate to meet the demand for this particular application. The purpose of American Monomer, therefore, is to concentrate on the production of scores of these specialty monomers, fully 80% of which will be used in plastics.

A typical specialty monomer is cyclohexyl methacrylate which can be used in acrylic contact lenses to make them harder and more scratch resistant. At present it is not available and there would not be a big enough demand for the large companies to manufacture it, but its use will grow over the years as the plastics industry finds it available.

Most of these monomers will be used as ingredients in copolymers to give special properties. Some might be used for cements as, for example, between acrylic sheets. American Monomer officials point out that their production of these monomers may eventually result in improvement of standard plastics. A spokesman observed that styrene might possibly be made as clear, tough, and easy to machine as acrylic by the use of the proper specialty monomers. He also pointed out that the use of special monomers could improve the properties of polyesters in castings and laminations.

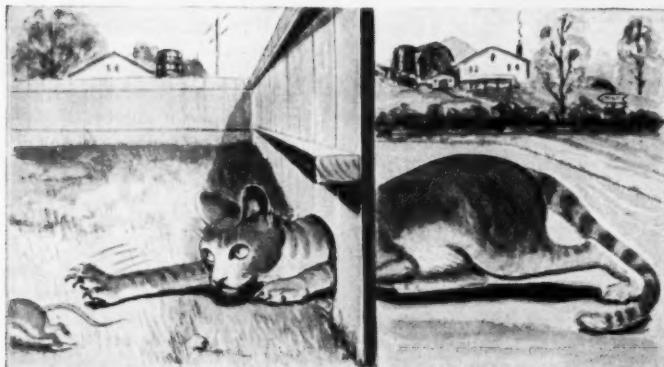
The company already has about 200 monomers, most of which are being sold in laboratory quantities. Some are available in pilot plant quantities, but production can be expanded to carload lots if required. It is expected that more monomers will be added to the list monthly.

## Plywood Process

A QUISITION of a new process for making low-cost, multi-purpose, three-ply wood panels from wood-waste has been announced by United States Plywood Corp., 55 West 44th St., New York 18, N. Y., following an agreement with Fred Fahrni, Swiss engineer. It will be produced first at a new plant to be erected by the company, which is expected to be in operation by the end of the year at Orangeburg, S. C. Plans call for an initial capacity of 40 to 50 million ft. a year on a  $\frac{3}{8}$ -in. basis.

Already successfully produced commercially in Europe, where it was known as Novapan, the product is made from shavings and chips

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into a composite board of three layers—two surface layers of wood shavings and the core material of wood chips. The board is finished with resinous materials.

## Inexpensive Molds

**C**OSTS of cavities and cores can be reduced from 50 to 80%, it is reported, by the use of new-type molds developed by French Williams Co., 2820 No. Sylvania, Fort Worth, Texas. The mold parts are cast by a patented process from inexpensive patterns of plastics, plaster of paris, wood, and other easily worked materials. Cores and cavities thus produced are claimed to be dense and solid, free of defects, and to have a smooth satin finish requiring a minimum of polishing.

The metal from which these molds are made readily takes hard chrome plating when desired. The coating procedure holds shrinkage to a tolerance of 0.003 in.; thus no allowance need be made for the shrinkage factor in preparing master patterns or models. Shipment of cavities and cores, it is said, can normally be made within seven days of receipt of patterns.

## Silicone Glass Molding

**B**ECAUSE of their great strength and heat resistance, silicone molding compounds have intrigued the plastics industry ever since the war. General Electric Co. now announces that it has developed a new silicone-glass molding compound which, it maintains, will withstand continuous operation at 392° F. The new material, called G-E 12810, has the usual high-impact and heat resistance expected of silicone and glass, has good flow in the mold, and excellent arc resistance. The compound is especially suited for circuit breakers and switchgears.

Complete technical data is available from the General Electric Co., Schenectady, N. Y.

Another development is a new polyester-type plasticizer designated

G-E 2559 by General Electric. The new material is reported to have very good heat, light, and weather resistance, improved oil and water resistance, as well as improved non-migrating characteristics. It is suitable for plasticizing polyvinyl chloride, ethyl and nitrocellulose lacquers, and chlorinated, natural, and synthetic rubbers.

Also coming from the General Electric laboratories is a thickness gage which, by using rays from a radioactive material, can determine the thickness of moving sheets of materials such as metal, rubber, plastics, or cloth. The radio-active material showers beta rays on the sheets being measured, and an electronic device measures the quantity of rays passing through. The gage makes the measurements continuously and automatically, without actually touching the materials, providing supervisors with a continuous check on the thickness of the sheets as they are produced.

## Decorative Laminates

**C**ALLED "Luxwood", a new decorative laminate available in five photographic wood finishes, is the latest of The Formica Co.'s decorative plastic laminates. Company officials assert that the photographic reproductions of natural wood grains are the most authentic yet offered and that fabricating technique is identical with the company's other patterned materials. Luxwood closely follows Formica's "Softglo," a solid color decorative laminate announced a few months ago.

## Junior Achievement Award

**A**JUDGING committee composed of Curt Cruver, president, Cruver Mfg. Co.; Luther Evans, president, Mayfair Molded Products Corp.; and Harry Hill of Celanese Corp. of America named Plasta-Gems the winner in the Chicago area elimination for the National Plastics Award sponsored for Junior Achievement companies by the So-

ciety of the Plastics Industry. Plasta-Gems, which shapes and internally carves ladies earrings, pendants, and broaches with high-speed electric drills, is one of 120 Chicago-area Junior Achievement companies composed of boys and girls who work one night a week to gain practical knowledge of the business system. Each Junior company is the counterpart of a large corporation.

## Britain in U. S. Markets

**I**MPERIAL Chemical Industries Ltd., of Great Britain is reported to have made an offer to acquire a controlling interest in Arnold, Hoffman & Co. It is also stated that the British company is negotiating to buy over 60,000 of the 93,000 common shares of \$10 each in the American company at \$55 each. At the current exchange rate of \$2.85 to the pound, the deal involves over \$3,000,000. Arnold, Hoffman & Co. states that although its annual report is not complete, audit showed a net book value as of Dec. 31, 1949 of \$29.28 a share.

If the offer is accepted, I. C. I. will acquire an interest in the manufacture of dye stuffs and other synthetic chemical products in the U. S. and a ready-made marketing organization for dyestuffs and auxiliary products made by I. C. I. in Britain.

## FINANCIAL NEWS

**C**elanese Corp. of America reports net income of \$20,640,826 in 1949 compared to \$39,484,000 in 1948. Sales were \$171,292,005 in 1949 compared to \$230,384,672 in 1948.

The company's net income for the three months ending Dec. 31, 1949, was \$9,651,956 or more than double the income of \$4,814,210 reported for the third quarter of the year. The number of employees at year-end was 17,772.

Of interest to the plastics industry was the Celanese report on the development of new formulations of flame-resistant acetate; the construction of additional facilities for producing film; and the continuing expansion of the company's chemical plant in Texas where such chemicals as formaldehyde, acetate acid, and acetone are provided for

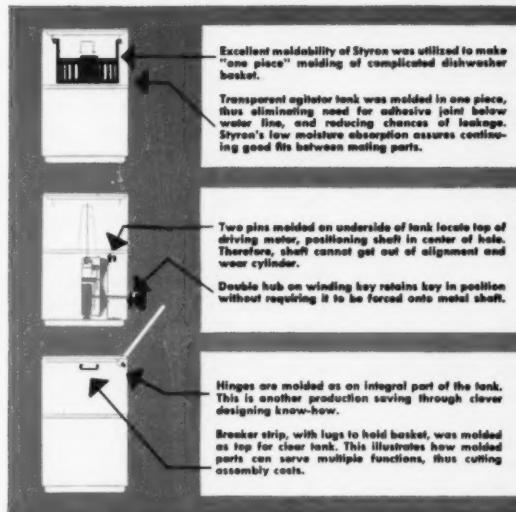
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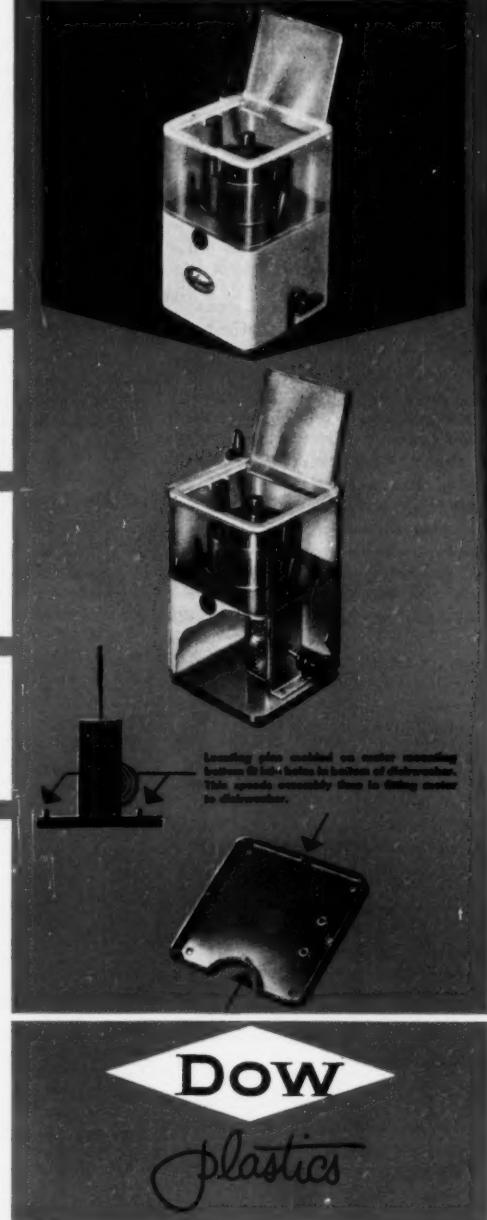
Plastics Division—Dept. SOT-25

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the plastics and textile industries. The company also won the 1949 award for chemical engineering achievement in recognition of its accomplishments in the application of the principles and processes of chemical engineering to the production of chemical fibers and organic chemicals. Net sales of the company have grown from \$4,500,000 in 1940 to \$171,300,000 in 1949, and net income has increased from \$6,400,000 to \$20,000,000.

**Eastman Kodak Co.** recently contributed a \$15,200,000 annual wage dividend to 46,000 employees in the United States. It was the largest in the plant's 38-year history. Eligible persons will receive \$25 for each \$1000 earned from Kodak from 1945 to 1949. Persons with five years service received dividends about 6½ times their average weekly wage. The plan is non-contributory.

Net sales last year were \$396,232,518 compared with \$414,977,519 in 1948. Net earnings in 1949 were \$49,770,699 compared with \$51,263,118 in 1948. The percentage breakdown of sales showed that 21% came from rayon, plastics, and wrapping film, while chemicals accounted for 6%.

**Fabricon Products, Inc.**, showed a net income of \$1,414,585 in the year ending Nov. 30, 1949, on net sales of \$17,534,069 compared with \$861,788 on sales of \$14,759,918 in 1948.

**E. I. du Pont de Nemours & Co., Inc.**, broke all previous records with sales of \$1,025,000,000 for 1949 which was 6% larger than in 1948. Half the increase was due to greater physical volume of goods sold, and the rest was attributed to higher sales prices. Larger volume of goods produced resulted chiefly from increased manufacturing capacities for nylon textile fibers, tetra-ethyl lead, cellophane, plastics, and acetate rayon. Profits from operations in 1949 were \$134,000,000, or 23% more than 1948.

The company spent \$86,000,000 for additional manufacturing capacity, principally for the manufacture of

nylon products, titanium pigments, polyvinyl alcohol, rayon tire yarn, and methanol. Construction of a plant for production of Orlon acrylonitrile fiber was started at Camden, S. C., in 1949 and will be in production this year.

At the end of the year there were 73,515 people on the firm rolls.

**National Vulcanized Fiber Co.** and subsidiaries had a net profit of \$871,194 for 1949 on net sales of \$12,179,921, compared with earnings of \$1,321,967 on net sales of \$16,147,096 in 1948.

**Farrel-Birmingham Co., Inc.**, had a net profit of \$901,291 on net sales of \$15,776,293 in 1949 compared with \$1,659,627 in 1948 when sales amounted to \$22,317,384.

**Monsanto Chemical Co.** sales were \$165,924,700 in 1949 compared to \$161,609,441 in 1948. Net income for 1949 was \$17,236,422 compared to \$18,042,473 in 1948. Total number of employees was 13,720 men and 1,917 women.

In a classification of sales by groups, the plastics, synthetic resins, and surface coatings led all others with \$49,000,000 in 1949 as against \$48,000,000 in 1948 and \$8,000,000 in 1939. The plastics and synthetic resins division has been first in Monsanto's sales since 1946 when it accounted for 17.3% of all company sales, but in 1949, although sales were higher, the percentage was 13.3% of all sales. Soap and synthetic detergents were second and accounted for 10.7% in 1949.

## COMPANY NEWS

**Precision Extruders, Inc.**, 224 Center St., New York, N. Y., has announced the resignation of **Pierce T. Wetter** as a director of the company. **Orville B. Sherman** becomes a director and vice president. **Solomon Senders** is treasurer.

**Hardesty Chemical Co., Inc.**, 41 E. 42nd St., New York 17, N. Y., reports that its new plant at Dover, Ohio, will soon be ready for large

scale production of sebacates, phthalates and adipate plasticizers.

**Mid-West Scenic Co.**, 1140 N. 4th St., Milwaukee 3, Wis., has announced that **Martin J. Tenenbaum**, formerly associated with S. Buchsbaum Co., Chicago, Ill., has joined the firm. The company, which specializes in stage scenery and draperies, plans to broaden its activities to include all plastic applications.

**Textileather Corp.**, Toledo, Ohio, has announced a line of new colors and effects in Tolon and Revelry, its all-plastic upholstery materials. The new stock line will contain 12 and 20 gage in solid colors and patterns.

**Arnkurt Associate Engineers**, 82 Beaver St., New York 5, N. Y., designer of plastics products, molds, and tools, has extended its services to include sculpturing, modelmaking, and experimental work.

**The Sorg Paper Co.**, Middletown, Ohio, has placed on the market a new-type counter covering with a baked plastic surface. Called Koverite, it is the company's latest development, and was introduced by **John Owen** who was recently named sales promotion director.

**Carbide and Carbon Chemicals Div.**, Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N. Y., has announced that **Arthur L. Snyder** has joined the Synthetic Fibers Dept., while **Robert W. Gaines** has been named technical representative with the same department. Mr. Snyder was previously with Burlington Mills and Du Pont, and Mr. Gaines comes from the company's plant in South Charleston, W. Va.

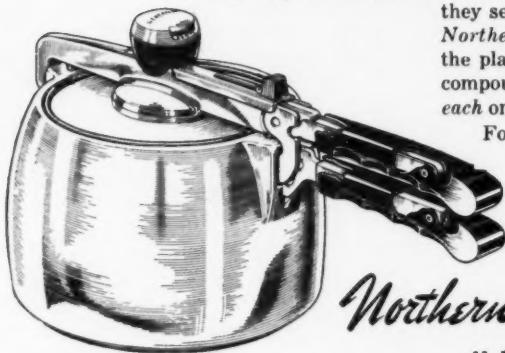
**Reichhold Chemicals, Inc.**, has reached an agreement with **Polyresin Products, Ltd.**, Woodbrook, East London, South Africa, which will manufacture Reichhold resins. The South African affiliate is the fifteenth plant in this chain.

**Lupomatic Industries**, 4510 Bulard Ave., New York 66, N. Y., manufacturer of the Tumb-L-Matic line of equipment, has announced a new material which can be used for making complete barrels or as a lining for tumbling barrels made of other materials. Called Tumb-L-Dur, the material is resilient, strong,

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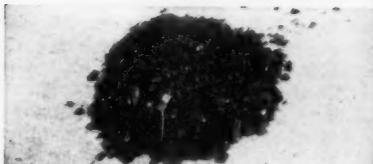
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does not warp, and can be readily worked, according to the manufacturer. It is suited for either the wet or dry process of tumbling.

**Hungerford Plastics Corp.**, Murray Hill, N. J., has reached an agreement with **The Ohio Rubber Co.**, Willoughby, Ohio, whereby the latter has expanded its services to include flexible vinyl and other thermoplastic materials. It also acquired exclusive sales rights for the Hungerford "Flex-Grip" used for handle-bar grips.

**The M. W. Kellogg Co.**, P. O. Box 469, Jersey City, N. J., has announced that the original price of Kel-F, a fluorocarbon-type thermoplastic, has been reduced about 50% due to greater sales and output.

**The Carborundum Co.**, Niagara Falls, N. Y., has announced the promotion of **Ernest R. Baxter** to assistant vice president, **Frederick W. Bonacker** to general sales manager, and **Fred W. Scott, Jr.**, to sales manager of the Coated Products Division.

**Plax Corp. Div., Hartford-Empire Co.**, Hartford, Conn., has named **E. Don Pam** as New York district sales manager; **E. W. Hunnicutt** has been transferred to the Chicago sales office. Mr. Pam was formerly with the Owens-Illinois Glass Co.

**Julian Cerf**, 267 Fifth Ave., New York, N. Y., has been named sole distributor for a new synthetic resin yarn with a polyvinyl chloride base which is manufactured by a French chemical concern. Called Rhovyl, it is said to be completely water-, mildew-, and rot-proof, resistant to most chemicals, non-flammable and to have a high tensile strength. According to the manufacturer, it can be used for insulation, draperies, curtains, carpets, automobile seat covers, and upholstery.

**Plastic Film Products Corp.**, 60 S. Seiberling, Akron, Ohio, has announced the formation of a new subsidiary, **Great Southern Plastics Corp.**, 118 Cole St., Dallas, Texas.

Headed by **H. F. Katchinska**, president and production manager, and **R. D. Sammons**, vice president and sales manager, the new company will produce table covers, draperies, curtains, and blanket bags.

**Almor Plastics Corp.**, 24-19 45th St., Astoria 3, N. Y., is a newly formed organization specializing in custom molding. **Robert Genin** is president, **Carl Haller**, secretary, and **Nat Wirch**, treasurer and sales manager.

**Noma Electric Corp.** has announced the appointment of **Stanley L. Marshall** as assistant to the executive vice president, and **William Hamilton** as assistant to the president. Mr. Marshall will supervise manufacturing facilities in Decorative Lighting and Plastic Divisions.

**Recto Molded Products, Inc.**, Cincinnati 9, Ohio, has a novel way of promoting its business in communities other than its own. Company officials took on the job of entertaining the Rotary Club at luncheon in Springfield, Ohio, by showing the Tenite film, distributing small molded items, and talking about plastics in general.

**Tennessee Eastman Corp.** announces that it has doubled the capacity of its warehouse and distribution center at Lodi, N. J. Among the chemicals available are plasticizers and acetate dyestuffs.

**Monsanto Chemical Co.** has announced that its Western Div. will start construction of a small plant at Santa Clara, Calif., immediately. The plant, which will produce synthetic resins and specialty coatings for the California area, is expected to be in operation before August 1.

**The Dorrie Process Co.**, 60 Greenpoint Ave., Brooklyn, N. Y., has announced enlarged facilities for the production of metallized acetate for use in displays, packaging, etc.

**The Dow Chemical Co.**, Midland, Mich., has announced that **Richard C. Alexander** has joined the com-

pany's plastic sales division and that **Frank J. Ward** has been transferred to the New York office to assume the duties of a plastic molding powder salesman. Mr. Ward has been with the company since 1945.

**Bee Chemical Co.**, 13799 S. Ave. "O", Chicago 33, Ill., is now offering a liquid for polystyrene to prevent dust attraction. Called Logo Stat, the liquid is dipped, eliminating special equipment, and should be applied immediately after molding to prevent dust accumulation during handling. According to the manufacturer, the liquid is not water soluble, but may be removed by ordinary soap and water when desired.

## PERSONNEL

**Daniel R. Mahan** has joined the sales department of **Tech-Art Plastics Co.**, 35-42 42nd St., Long Island City 1, N. Y. He was with Atlantic Plastics and Die Molding Corp.

**William Gross** has been appointed sales promotion manager for **Plastics Guild Corp.**, 85 Fifth Ave., Paterson 4, N. J., plastic film printer. Mr. Gross was formerly production manager of Hartford Textile Corp.

**Lawrence A. Bergman** has been appointed sales manager for **Camp Plastics, Inc.**, 15 Camp Place, Newark 5, N. J., extrusion and injection molder. Mr. Bergman was formerly with Waljohn Plastics.

**Morris Barchard** has been named direct factory representative to handle engineering and sales for **Michigan Molded Plastics, Inc.**, Dexter, Mich. He will cover the Ohio and Indiana territory.

**Melvin V. Kemper** has been appointed sales engineer for the **American Insulator Corp.**, New Freedom, Pa. Mr. Kemper will operate in the southern Ohio area with headquarters at 1533 Olmsted St., Dayton 6, Ohio.

**Louis E. Tallman** has been named technical service representative for **The Dow Chemical Co.**, Midland, Mich. with headquarters at the company's office in Los Angeles. He has been with the firm since 1940.

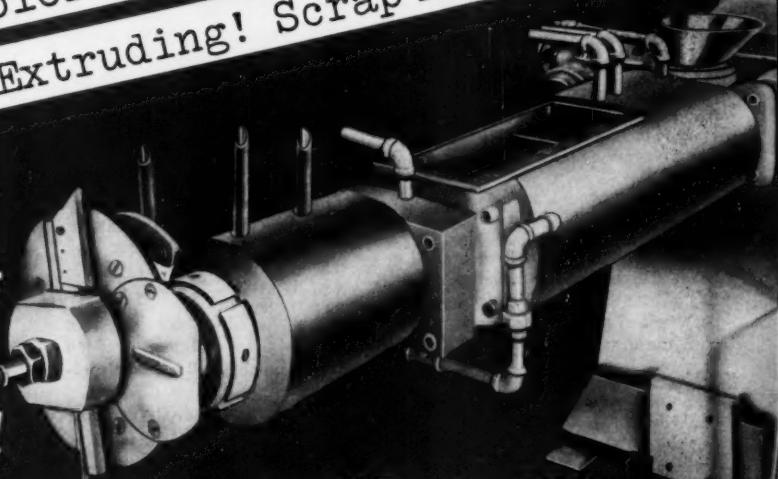
**Dr. Ernest O. Ohsol** has been appointed manager of chemical process development of the **Chemical Dept.**

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Now — not only the advantages of a dual worm compounder-extruder but also the extra features of a *longer* compounder-extruder are yours in the improved Series 52 machines. Longer, more powerful counter-rotating back worms take easily dry-blended feed, color it better, compound it better, prepare it for pelleting or finished extrusion. All this at faster rates, too! These same worms, with their positive feed action, can literally "draw in" scrap being fed at the hopper. The result . . . elimination of many feeding difficulties, no surging and in many cases, no grinding beforehand. Further forward in the barrel, longer front worms convey the material under the longer open section where entrapped moisture and volatiles readily escape into the atmosphere from the hot plastic material. When needed, this open section can also be fitted with a special vacuum extraction device for materials with high moisture content. This means crystal clear extrusion at the die. And what is more, no bulky and expensive pre-drying equipment is required when the extractor is used.

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This machine will assure you of a constant supply of precision pellets whenever you need them. Simply stock virgin materials and compound them to your own specifications in amounts large or small. No large inventories, no waiting for deliveries, no quantity extras. You are the master of your material supply when you own a Welding Engineers' Series 52 compounder-extruder.

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of **General Electric Co.** He was with Standard Oil Development

**C. R. H. Carlson** has been appointed district manager in charge of the Chicago metropolitan area for **The Watson-Standard Co.**, Pittsburgh, Pa.

**M. K. Smith** has been named director of the **Technical Div. of The Baker Castor Oil Co.** where he will be in charge of all technical activities of the company except engineering and agronomy. He has been with the organization since 1941.

**Harris Brin**, formerly president of **Modern Plastics, Inc.**, Dallas, Texas, has been appointed sales manager for **Loma Plastics, Inc.**, 1111 Foch St., Fort Worth, Texas.

**Donald H. Jones** has been appointed general sales manager of the **Coating and Fibron Divs., Irvington Varnish & Insulator Co.**, Irvington, N. J. He was formerly with **American Transformer Co.**, Newark, N. J.

**Robert G. Strong** has been appointed New England District manager for **Manco Products Co.**, Melvindale, Mich. His headquarters will be in the Statler Office Bldg., Boston, Mass.

**Thomas P. Gallagher** has been named assistant sales manager for **Munray Products, Inc.**, 12400 Crossburn Ave., Cleveland, Ohio. He was formerly with **Atlas Engineering Co.**

**John Guiliams** has been appointed **Chemical Div.** representative for the **Goodyear Tire & Rubber Co.** Covering the New England area, his headquarters will be in Boston, Mass.

**Paul L. Johnstone** has been named manager of the **Market Development Div., Synthetics Dept., Hercules Powder Co.**, Wilmington, Del. He has been with the company since 1940.

**Richard R. Blair** has been named technical representative for the **Columbia Chemical Div., Pittsburgh Plate Glass Co.**, 632 Duquesne Way, Pittsburgh 22, Pa. Covering the mid-

western states, Mr. Blair's headquarters will be at the Chicago district sales office, 1721 Tribune Tower Bldg., Chicago, Ill.

**Ralph S. Gavitt** has retired as district manager of the New England Office of the **Plastics Div., Celanese Corp. of America**. He has been with the company for 22 years. **Samuel W. Murray** has been transferred from the West Coast office to succeed Mr. Gavitt.

**Thomas K. Liversidge** has been elected president of **Harmonic Reed Corp.**, 1628 Callowhill St., Philadelphia 2, Pa., producer of plastic and brass reed harmonicas. He succeeds Gen. **Paul X. English**.

**Daniel Pinzow**, 1056 Sherman Ave., Bronx, N. Y., has announced that he plans to build a \$1,500,000 plant for injection and compression molded plastics at Metropolis, a small city in southern Illinois. Mr. Pinzow says he hopes to have his plant in production in 1952 and expects to require the services of 1000 employees. He states that he has had no previous experience in the plastics industry but will hire a team of experts to give the public "the best that science can produce."

**Herbert F. Schaefer** has joined the Sales Research Div. of **Hercules Powder Co.**, Wilmington, Del. His duties will include market surveys and development for the company's products.

**James W. Kearns** has been named a sales engineer for **Plastics Div., Continental Can Co.**, Cambridge, Ohio. Mr. Kearns' headquarters will be in the company's office at 122 E. 42nd St., New York 17, N. Y.

## Deceased

**Richard B. Harrison** died in Chicago on Feb. 21 at the age of 52. Mr. Harrison was once vice president of the **Plaskon Div., Libbey-Owens-Ford Glass Co.**, Toledo, O.

**James Patrick Sullivan**, 45, president of **Connecticut Plastic Products**

**Co.**, his son James, Jr., 12, and Merril E. Fortin, 46, a tool maker for the plastics company, were killed in Mr. Sullivan's Bellanca plane when it spun out of a low cloud bank into a pasture near Merion, S. C. on March 7.

**Henry Jenett**, president and founder of the **Selectron Corp.**, Montclair, N. J., died at his home recently. He was a pioneer in the development of inks for plastics and helped develop Interchemical Corp's well known Aridyne inks. At the time of his death he had made considerable progress on the development of an ink for printing on polyethylene. His company produced a strip coating material called Gelastic. Mrs. Jenett will continue the activities of the company.

**Charles L. Neely**, 40, sales manager of glues and industrial resins for the **Plaskon Div., Libbey-Owens-Ford Glass Co.**, Toledo, Ohio, died of a heart attack on March 8.

## MEETINGS

**May 25-27**—Society for Experimental Stress Analysis, Hotel Statler, Cleveland, Ohio.

**May 25-26**—S.P.I. Plastics Film, Sheeting, and Coated Fabrics Div. Conference, Commodore Hotel, New York, N. Y.

**May 28-31**—American Institute of Chemical Engineers, Regional Meeting, New Ocean House, Swampscott, Mass.

**June 1-2**—American Society for Quality Control, Fourth National Convention and Fifth Midwest Conference, Milwaukee Auditorium, Milwaukee, Wis.

**June 26-30**—A.S.T.M. Exhibit of Testing Apparatus and Related Equipment, Atlantic City, N. J.

**July 22-27**—New York Curtain and Drapery Show, New York, N. Y.

**Aug. 7-19**—United States International Trade Fair, Chicago, Ill.

## S.P.E. Meetings

**May 17**—New York Section of S.P.E. at Hotel Shelburne, New York, N. Y. Michael A. Brown, Jr., Plaskon Div., Libbey-Owens-Ford Glass Co., will speak on "Alkyd Molding Compound."



Pre-weighed . . . No measuring . . . No mess . . .

Each sealed, pre-weighed package of Jamison Color Mix contains sufficient material to color 100 pounds of crystal polystyrene. Your powder man just mixes the contents of the bag with crystal polystyrene for 10 to 20 minutes . . . then you're ready to mold.

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Jamison Color Mixes, tested in over six years of actual molding plant use, yield consistent results, because of the special way in which all ingredients are carefully pre-blended.

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Color Mixes are available for preparing all standard transparent and translucent colors. Special colors can be supplied on quantity orders.



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Because we've had many years experience in molding with this tough, shock and wear-resistant material. We have precision-molded countless thousands of fine gears, bushings, washers, skid blocks, rollers, rivets, etc., in our complete and most modern plant.

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#### DOWN GO COSTS

The savings obtainable with Jamison Color Mixes favor their use over pre-colored materials. Labor costs are almost non-existent. Jamison Color Mixes can be mixed on most standard mixing equipment or on special units which we recommend.

#### DETAILS & LITERATURE . . . WRITE

Send today for the complete story on Jamison Color Mixes and the money they can save you. Please mention the type of mixing equipment you have, if any.

## H. JAMISON PLASTICS

11 West 42nd Street, New York, N. Y. • Plant: Freeport, L. I., N. Y.



Master Hob by  
Plastol Specialties Co.  
Seattle, Wash.



TRU-CAST Cavity Sawed in half  
to show detail and finished plastic part.

TRU-CAST Beryllium Copper castings by MANCO enlarge the scope of your molding possibilities. You are assured of dependability and accuracy to your most exacting requirements. TRU-CASTINGS are available where cold hobbing leaves off.

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# MODERN PLASTICS CLASSIFIED ADS GET RESULTS!

Classified advertisements in MODERN PLASTICS are an effective, inexpensive means for buying and selling used plastics machinery, hiring personnel, finding employ-

ment and establishing business contacts. These concise notices are read carefully each month by people with specific wants—that's why they get so many "live" responses.

Here are some typical results from recent MODERN PLASTICS classified advertising:

FOR SALE: 1½" extruder  
WANTED: 2 or 4 oz. injection machine  
WANTED: Plastic scrap  
SITUATION WANTED: Sales executive-engineer  
FOR SALE: Used molds for children's toys  
WANTED: Manufacturers' representative  
HELP WANTED: Molding plant supervisor  
FOR SALE: Plastic advertising and manufacturing novelty business

15 replies  
7 replies  
23 replies  
8 replies  
20 replies  
8 replies  
6 replies  
8 replies

Results like these occur month after month. Rates are surprisingly low and mail box and forwarding service are available at no extra cost. For further information and rates, write to Classified Advertising Dept.

## MODERN PLASTICS

A Breskin Publication

122- East 42nd Street

New York 17, N. Y.



Here is a tempting package no customer can resist. It's the new, colorful plastic draw-string bag, fashioned from vinyl or polyethylene. Perfect for merchandising toilet soaps, bath salts, cosmetics, toys, foods, novelties and what not. Available in a variety of colors and sizes with contrasting draw-string. Offers unlimited re-use value.

Write for sample and suggestions to meet your individual requirements.

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Pioneers in Plastic Fabrication Since 1910

18 West Parker Avenue, Maplewood, New Jersey

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AS WELL AS REGULAR VINYL MILLED AND CALNDERED FILMS . . . A BETTER STABILIZER FOR HIGH TEMPERATURES, ULTRA-VIOLET AND OUTDOOR AGING . . .

Here is a newly developed stabilizer in paste form for high temperatures, ultra-violet and outdoor aging that improves other properties in vinyl films as well . . . It gives excellent light fastness, improves the transparency of clear films and gives films that do not absorb water and do not "blush" . . . It is compatible with all tested pigments — even organic reds hold their hue and age well when used with it.

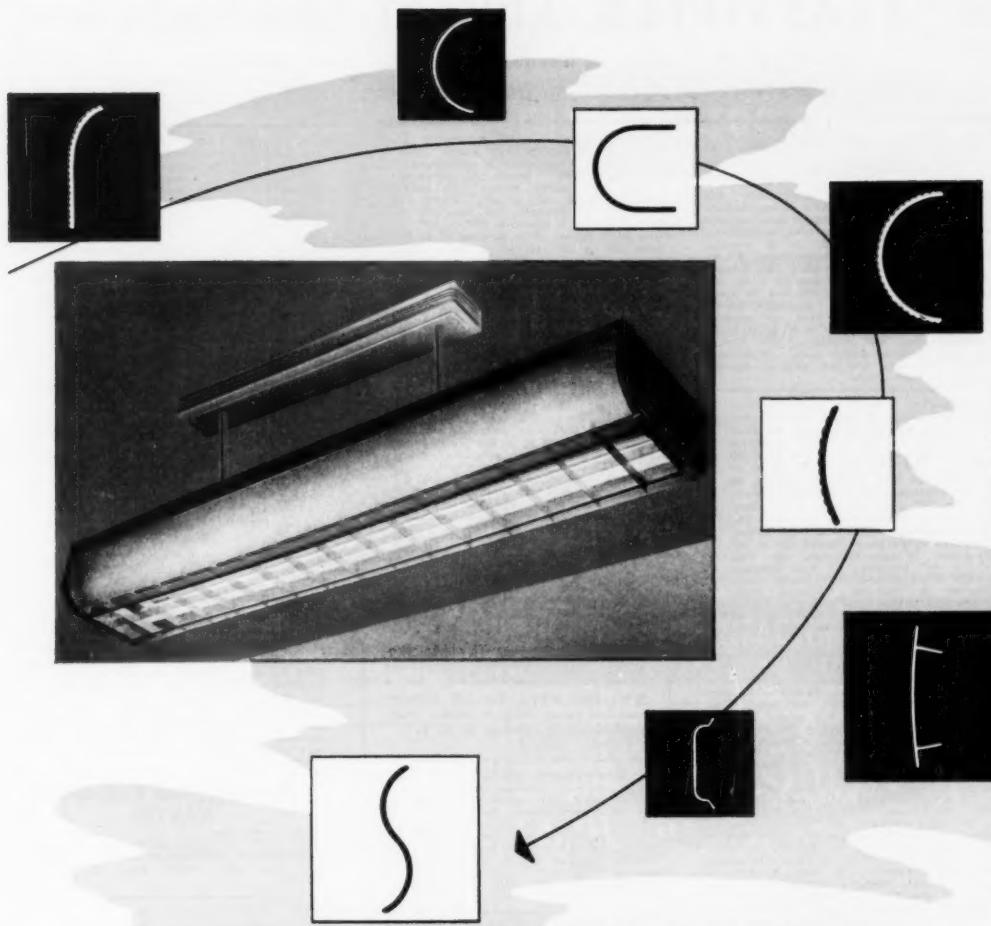
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**HARWICK STANDARD CHEMICAL CO.**

AKRON 5, OHIO

BRANCHES: BOSTON, TRENTON, CHICAGO, LOS ANGELES



## EXTRUDED PLASTIC PANELS for Lighting Fixtures

Shown are some of the stock shapes we have available for immediate delivery. We produce them in clear material as well as in various degrees of opacity formulated to your specification.

If you have special requirements, Yardley engineers will design flat

or profile sections up to 10" in width.

Yardley extruded plastic panels eliminate breakage troubles, provide more even light diffusion, offer greater versatility in design. Investigate.

There's an experienced Yardley representative near you.



**YARDLEY PLASTICS CO.**

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May • 1950



"There Is A Temperature For Every Mold Where It Will Operate  
At The Fastest Cycle With Uniform Quality Of Product!"

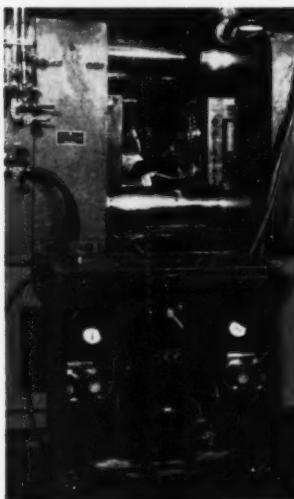


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Press  
Mfg. Co.

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Room 603, 570 7th Ave., New York 13,  
N. Y.  
Richardson Agencies Limited  
454 King St. West, Toronto 1, Canada

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### WILL HELP YOU

- INCREASE PRODUCTION
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SUBSTANTIALLY REDUCE

Sink Marks • Bubbles • Blisters  
Prominent Welds • Crazing  
Poor Surface Finish • Warpage  
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WRITE FOR OUR NEW BOOKLET ON "THERMOLATOR CONTROL"

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Reprints of any article which appears in Modern Plastics are available at extremely moderate prices.

Many business organizations regularly distribute such reprints to customers and prospects as a matter of goodwill and service. Other companies equip their salesmen with reprints of pertinent Modern Plastics articles to bolster their sales story.

If there is any feature in this or other issues of Modern Plastics which can be of value to you in reprint form, ask for quotations *right now*.

Address your inquiry to . . .

### INDUSTRIAL MAGAZINE SERVICE

AN AFFILIATE OF BRESKIN PUBLICATIONS  
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It's simply a matter of addition:  
MODERN EQUIPMENT  
+ SOUND ENGINEERING  
+ 32 YEARS PRACTICAL  
EXPERIENCE  
= SUPERIOR MOLDS  
LARGE MOLDS—  
UP TO 20" x 30" x 60"  
CAVITY SIZE — OUR SPECIALTY

Our service includes complete engineering coverage from original product design to ultimate testing of the mold on our 8 or 16 oz. injection machines.



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TELEPHONES: MARKET 3-1572-73

SINCE  
1918

## CLASSIFIED ADVERTISING

(Continued from Page 182)

**H.P.M.-4 or PLASTIC INJECTION MOLDING PRESS WANTED:** Prefer little used post-war machine with automatic controls, Wheeleco, oil filter, pressure and temperature gauges; must operate on 220 volt, phasor, 60 cycle current. Dry film, including low F.O.B. cost price, where machine may be inspected in operation. HAZELLE'S MARIONNETTES, 905 E. 10TH ST., KANSAS CITY 6, MO.

**WANTED:** 2235 and #20903 Stokes Automatic Molding Presses by electrical manufacturer. Please write Box 415, Modern Plastics.

### Material For Sale

#### PLEXIGLAS AND LUCITE

New Material, .060, .080, .100, .125, .150, .175, .200, .312, .375, below list price. No charge for cutting to size. Plexiglas. Trade A, Red Flourescent, .125, .150, .175, .200, .320, below list. ARISTOCRAT PLASTICS, INC., 55 Clarkson St., New York, N. Y. W. Atkins 4-4216

**FOR SALE:** 23,000 lbs. of reground ethyl cellulose, all light colored.

11,000 lbs. of reground black Tenite II. 10,000 lbs. of elastomer reground vinyl in all colors. Reply Box 426, Modern Plastics.

**FOR SALES:** VINYL and polyethylene scrap to consumers only. Clean. Will sort to specifications. Reply Box 422, Modern Plastics.

### Materials Wanted

**WANTED:** Plastic Scrap, Rigid Vinyl, Cellulose Acetate, Polyvinyl, Polyethylene. Custom cutting, grinding, granulating, compounding, and straining of contaminated plastics. Franklin Jeffrey Corporation, 1671 McDonald Avenue, Brooklyn, N. Y. EA 5-7942.

**WANTED:** Ethyl Cellulose reground scrap, any color and quantity. Send Samples offered. Reply Box 500, Modern Plastics.

"Do you want a reliable, constant outlet for your trimmings, scrap, and other waste? We are buyers of vinylite and polyethylene waste." Write to Box 503, Modern Plastics."

**WANTED:** BUTYRATE surplus inventories wanted for immediate cash. Also all other injection compounds in large quantities. Dussi-Wallace and Company 60 East 42nd Street, New York 17, N. Y.

**WANTED:** PLASTIC Scrap or Rejects in any form. Acetate, Butyrate, Polystyrene, Acrylic, Vinyl, Polyethylene, etc. Also wanted surplus lots of phenolic and other molding materials. Custom grinding, magnetizing and compounding. Reply Box 416, Modern Plastics.

### Molds For Sale

**BEAUTIFUL SET OF INTERCHANGEABLE MOLDS, FOR 1, 2 & 3 GANG TOGGLE, 1-GANG DUPLEX, & COMBINATION DUPLEX AND TOGGLE WALL PLATES OF ACCEPTED DESIGN FOR SALE AT REASONABLE PRICE. CAN BE USED ON 8 oz. OR LARGER INJECTION MACHINE. PLATES HAVE HAD WIDE ACCEPTANCE ON ENTIRE ATLANTIC SEABOARD. PRICED REASONABLY. HOBBLINGS AVAILABLE FOR PUSH BUT, TURN ETU. REPLY BOX 515, MODERN PLASTICS.**

#### FOR SALE

Injection Type Molds: one 8-cavity toothbrush container mold, one 6-cavity special designed beautiful Soap-Box, one 6-cavity Soap dish-like 4-cavity novelty item and one 4-cavity toothbrush and container molds, as well as several other molds. All molds to fit the 8-ounce Reed-Prentice or any other injection machine. Molds are guaranteed almost new and in perfect working condition for immediate possession. Reply Box 523, Modern Plastics.

### Help Wanted

**REPRESENTATIVE wanted.** Several territories are open to experienced representatives in the plastic sales field, common basis for molder equipped to do compression-transfer and injection molding. Please state experience and territory in which you are now operating. Box 413, Modern Plastics.

**QUALITY-PRODUCTION CONTROL engineer** for molding division, N. E. Write details of experience, salary expected. Reply Box 421, Modern Plastics.

**WANTED—Experienced plastics engineer** familiar with compression mold design. Western New York location. Write full details on experience, references and salary expected. Reply Box 420, Modern Plastics.

**We need AN EXPERIENCED MAN FAMILIAR WITH PACKAGING AND SALES PROBLEMS ON THIN FILMS—CELLULOSE OR PLASTIC.** Will work mainly in Ontario. This is an opportunity in the Sales Organization of a responsible company. The position is permanent and commands an excellent salary. Outline experience when replying. Box 418, Modern Plastics.

**"YOUNG MAN WANTED—25 TO 30 YEARS OLD, WILLING TO WORK IN SALES FIELD, WITH GENERAL KNOWLEDGE OF PLASTICS, STATE AGE, EXPERIENCE AND SALARY. ALL REPLY WILL BE KEPT CONFIDENTIAL."** REPLY BOX 424, MODERN PLASTICS.

**WANTED—Sales Representative** for Mid-West, New Jersey, Pennsylvania and Northern New England, for custom molded products, principally compression and transfer molding. Old established molding concern with modern efficient equipment for precision molding and mass production. Presses from 25 to 500 ton. State experience, reference and territory desired. Reply Box 501, Modern Plastics.

**WANTED EXTRUSION FOREMAN.** TO HANDLE PRODUCTION OF MEDIUM SIZED EXTRUDING PLANTS. MUST KNOW EXTRUDING EQUIPMENT AND SETUPS. SEND RESUME AND SALARY EXPECTED METROPOLITAN AREA. REPLY BOX 509, MODERN PLASTICS.

**PLASTICS JEWELRY FOREMAN, Massachusetts.** Write details of experience in plastics Jewelry assembly supervision and salary expected. Modern Plastics, Reply Box 520, Modern Plastics.

**CHEMIST:** fully familiar with manufacturing of bakelite molding compounds from laboratory to finished product. Attractive proposition for right man. Reply Box No. 522, Modern Plastics.

#### SALES REPRESENTATIVES AND JOBBERS

Calling on 5 and 10 stores, drug, department stores. California's hottest popular priced plastic line. Please state territory covered, number of men and lines carried.

Reply Box 505, Modern Plastics.

#### ENGINEER

Plastics Engineer experienced in cost estimating tool design and for expanding molding operation. Must have thorough knowledge of plunger, transfer and straight compression molding as well as injection molding. College engineering graduate preferred. Send complete resume and salary requirements to General Manager, Continental Can Company, Inc., Plastics Division, Cambridge, Ohio.

#### PLASTICS PROPRIETARY SALES MANAGER

Wanted to head up sales organization for large mid-western company specializing in the proprietary hardware field. Man selected must have specific accomplishment in plastic proprietary line, and must be able to select line of products and to develop and set up sales organization. Capital is available to push the line into volume of seven figures in two years. Write fully giving complete experience record to Box 512, Modern Plastics.

#### PLASTICS SALES ENGINEER

Wanted for expanding mid-west molder of injection and compression parts. Several territories still open for experienced Sales Engineer having a successful accomplishment in the sale of custom molded parts. Compensation based on salary and bonus. This is an excellent opportunity for experienced man with ability to produce. Write fully giving a complete resume. Reply Box 513, Modern Plastics.

### Situations Wanted

**CHEMICAL ENGINEER.** Frenchman, 27, married no children war veteran. Graduated Chemistry and Physics. Fluent French, English, Spanish, Italian, German. Europe and Middle East. Interested technical job with American firm engaged in erection or operation of chemical plant Europe Middle East or other countries. Reply BS/QZ/90160 e/o Société de Banque Suisse 2 Rue de la Confédération, GENEVE Suisse. (Secrétaire Etranger).

#### PLASTICS CONSULTANT LOW PRESSURE LAMINATING

Specialist in the low pressure molding of Fiberglas yarns, fabrics and mats with plastic resins. Write for information in the research and development of new techniques in this industry. Qualified to increase production in established molding departments or to organize new divisions. CHARLES A. SCOGLAND, 4775 Tampa Street, Philadelphia 20, Pa.

**COATINGS CHEMIST:** Production and development. Inorganic and organic resins and rubbers. Experienced as technical director in both electrical and chemical fields. Laminated, impregnated, coated and printed products, including decorative packaging and polyethylene film extrusion. Available for two days per week on permanent basis. Reply Box 408, Modern Plastics.

26 and seeking: DESIGNER-ILLUSTRATOR with four years top training and three years experience. Industrial Designing, Illustrating and Promotions. Present monthly salary \$275.00. I want possibility for development and advancement. Reply Box 521, Modern Plastics.

**MECHANICAL ENGINEER.** 37, just back after two years foreign experience in the use of plastics factories, training and instructing personnel. Seventeen year's industrial experience. Thoroughly familiar with all phases of development and production of plastics (injection, compression, extrusion) as well as die and mold design and supervision of construction, also designing of special equipment. Reply Box 423, Modern Plastics.

### Miscellaneous

Wish to purchase half interest or outright, small moulding plant with one, two or three six or eight ounce moulding machines. The location must be either in the metropolitan N. Y. area or Long Island. Reply Box 502, Modern Plastics.

**ESTABLISHED MANUFACTURERS' AGENT AND DISTRIBUTOR, INDUSTRIAL PLASTICS SPECIALIZING NYLON, OPEN ADDITIONAL LINE PLASTICS OR ALLIED USED IN PRODUCTION. REPLY BOX 504, MODERN PLASTICS.**

**NEW PRODUCTS & INCREASED VOLUME** of business in today's competitive market can result from an aggressive program of Product Design and New Product Development. Business executive with fifteen years experience in Industrial Design and Manufacturing has an outstanding record of building sales volume through the development of new products in the hardware, giftware, appliance, toy, plastics and juvenile field. He desires to associate with a reputable manufacturing or merchandising concern doing a volume of a million yearly and interested in doubling that volume. He prefers to earn or buy an interest in the concern. Reply Box 511, Modern Plastics.

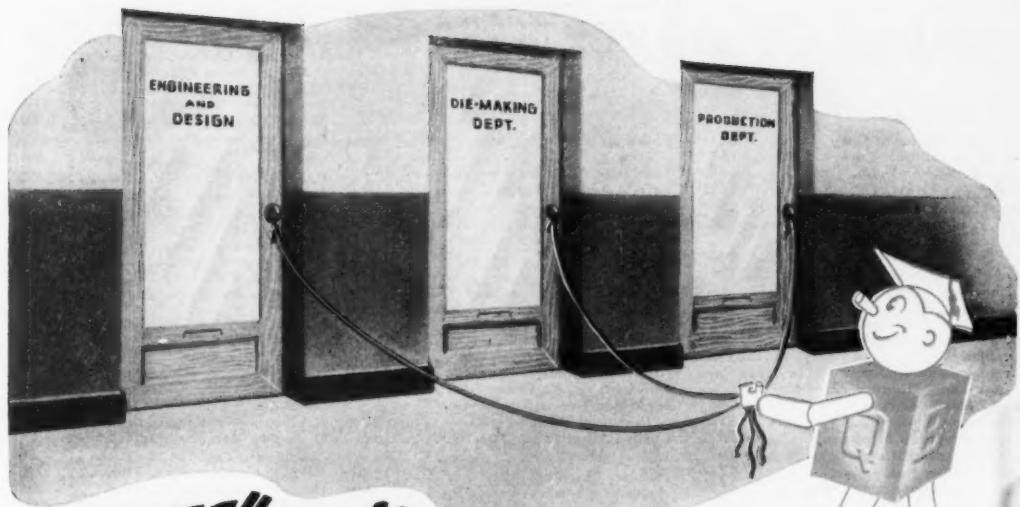
**MANUFACTURERS' AGENT CALIFORNIA** has increased sales 65% past two years. Emerging market. Graduate Harvard Business School can give full coverage on equipment and materials. Commission basis. Box 419, Modern Plastics.

#### ATTENTION PACIFIC COAST MOLDERS

**FOR SALE:** Operating injection molding plant and its proprietary items. Complete molding facilities and mold shop. 35 active proprietary molds. Five 8 oz. Reed Prentice machines and other factory equipment in splendid condition. Well established company catering to chain stores and jobbers. Plant located in Pennsylvania; approximately 30,000 square feet, low rent, nominal wages, present personnel may be retained. Reply Box 502-M, 217-7th Ave. New York 11, N. Y.

**Injection molding plant wanted.** Preferably with toy, notion and novelty molds. Will buy ready going business or equipment separately. State particulars. Box 514, Modern Plastics.

Would like to set up small efficient Plastic Can factory. Virginia would like to contact two or three fellows to invest in business with me. Writer has practical on the job experience in all phases of compression and injection molding of plastics as well as plant set up of which I have previously been a part. Age 41, PH.D. Reply Box 427, Modern Plastics.



# "CUBEE" pulls all the strings...

## HE TAKES COMPLETE CONTROL

Doesn't it always simplify matters when you can "dump" a problem into someone's lap and forget it? That's why "Cubee" has a big lap. He takes complete control. All the facilities needed to supply you with molded plastics parts are under one roof . . . our roof. We design the molds—we make the molds—we mold the plastics product. Nothing is "farmed-out". The complete responsibility is ours. And why shouldn't it be? That's our business—Plastics! The next time you need molded plastics products, call "Cubee". We'll consult with your engineers and designers and come up with the answers to your problems.

*Write, wire or phone for further information.*

QUINN-BERRY CORP.  
2655 West 12th Street  
ERIE, PENNSYLVANIA



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### *Q-B Says:*

"If you're sweatin' and stewin'  
'Cause you need plastics parts  
Just call in Quinn-Berry  
Then our worryin' starts!"



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**MODERN PLASTICS**  
122 EAST 42nd STREET • NEW YORK 17, N. Y.

Modern Plastics



## THEY'RE ALL INTERCHANGEABLE

Whatever you require in interchangeable punches and dies—round, square, oval, any special shapes, in tool steel or high speed steel—R-B can supply them—when you need them.

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Department 43

12627 Burt Road • Detroit 23, Michigan



May • 1950

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- 50-75 lbs. per hour capacity
- handles gates, sprues, etc. from 1/4" to 1/2" sectional thickness, dependent on type material
- hinged hopper designed for simplest cleaning
- 19" deep, 21" wide, 50" high, for minimum floor space
- 1 Hp Motor, v-belt drive



IT'S OUT NOW—AT LAST, a small size, low cost grinder with a sizeable throat opening, for individual mounting along side of injection molding machinery... featuring all of B & J's famous patent rotary cutter features.

### OTHER NEW WIDE THROAT B & J'S:

Model No.	Throat Opening
251	8" x 8"
Standard Ideal 301	6 3/4" x 10"
Heavy Duty 351	6 3/4" x 10"
1/2 — 451	8" x 22"

Sizes 1 to 2 1/2 available with throat openings varying up to 12" x 36", with heavier production capacities, up to 2 tons per hour.

### ASK YOUR NEAREST REPRESENTATIVE

CHICAGO: Neff, Kehlbusch & Bissel Inc. DETROIT 19: Thorsen-McCosh. LOS ANGELES & SAN FRANCISCO: Machinery Sales Co. NEW ENGLAND: Standard Tool Co., Leominster, Mass. ATLANTA: George L. Berry. ST. LOUIS: Larrimore Sales Co. CLEVELAND 22: L. F. Willmett. SEATTLE 4: Olympic Supply Co. KANSAS CITY: Kasey Fluid Engineering Co. MINNEAPOLIS: Winton Heimann Co. CHICAGO: Standard Co. CINCINNATI: Index Machinery Corp. DALLAS: Perry Machinery Corp. CANADA: Williams & Wilson, Ltd. Toronto & Montreal. FRANCE: Importex, Paris 1. Foreign Distributors: Omni Products Corp., New York 16.

## BALL & JEWELL, INC.

22-28 Franklin Street  
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1865 — 1950

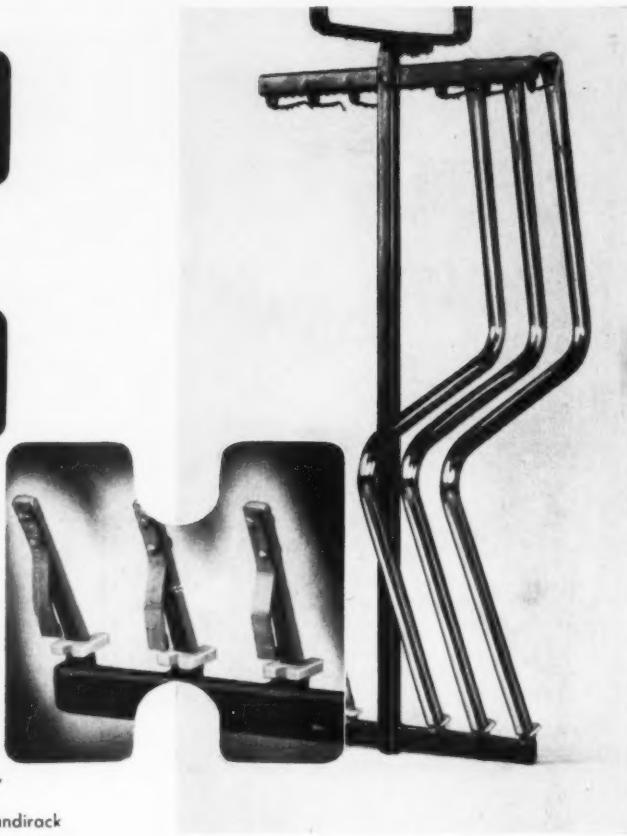


A LITTLE  
WASHER  
*Racks Up*  
A BIG  
SUCCESS



For the Gaychrome Company, manufacturers of tubular steel chair frames and Handirock towel racks, good things come from Worcester Moulded Plastics in the form of small polyethylene washers. The plating racks which hold these chair frames, are rubber coated with the exception of the electrodes to protect them against the acids throughout the chrome plating process. The rubber coating, however, constantly broke or split open from the impact of jamming the frames over the electrodes on the bottom bar of the rack. When "homemade" washers between chair frame end and the bar proved unsuccessful, Gaychrome turned to WMP.

For the answer, we moulded an easy-to-apply, self-draining washer of polyethylene — impervious to hot and cold acids and alkalines, constantly ductile even in 280° chromic acid, and non-breakable under the most severe jamming. Perhaps this small example of a WMP solution puts you in mind of some large or small plastics problem which has been puzzling you. Let us give you the answer.



Courtesy The Gaychrome Co., Worcester, Mass.

**WMP**  
Custom Injection Moulding  
**WORCESTER MOULDED PLASTICS CO.**  
14 HYGEIA STREET, WORCESTER 8, MASS.  
17 East 42nd St., New York 17, N. Y.



Lamp Shades courtesy  
L. A. Goodman Mfg. Co.  
131 West 63rd, Chicago, Ill.



## Light the Way to New Sales!

with **VINYLITE** Plastic Rigid Sheets  
BRAND

A new kind of lamp shade is brightening the sales picture for hundreds of merchants today—because a manufacturer had a brilliant idea!

L. A. Goodman Company, with an outstanding background in the processing of sheeting and strip stock, decided to produce lamp shades and chose **VINYLITE** Brand Plastic Rigid Sheets because they are:

- ★ **Tough**
- ★ **Will not support combustion**
- ★ **Waterproof, washable, non-porous**
- ★ **Available in many colors—translucent, transparent, or opaque, with smooth or matte surfaces**
- ★ **Dimensionally stable**
- ★ **Easily formed and joined**
- ★ **Resistant to oils, greases, alkalies, most strong acids**
- ★ **Excellent light diffusion & transmission properties**

These unusual properties can go to work for you, too, in signs, displays, business calendar cards, doll faces,

drafting instruments, and a host of other products. For these materials may also be printed to exact register in any arrangement of colors, and embossed in any design, and shaped to deep three dimensional forms.

If you have a product that can benefit from any one of the many **VINYLITE** Plastics, it will pay you to get in touch with us. Our forty years of experience with plastics are at your service. Write Dept. HJ7.

**Vinylite**  
BRAND  
**PLASTICS**   
**BAKELITE**  
**DIVISION** 

**BAKELITE DIVISION, Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y.**

# NOW - to help you make better vinyl and rubber products - 2 NEW G-E PLASTICIZERS

Now you have a choice of two General Electric plasticizers to help you improve your compounds and lacquers: G-E 2557 and G-E 2559. Both are polyester-type designed for plasticizing vinyl and rubber compounds, and nitrocellulose and other lacquers. They are suitable for use in sheetings, coatings and extrusions; for fabrics, upholstery, weltings, electrical insulation and for many other similar products.

Either of these two G-E plasticizers may be the means of helping you make a better product more quickly and economically. Find out which one is best for your purposes by writing us at Section C3, Chemical Department, General Electric Company, Pittsfield, Massachusetts. Or use the coupon for full technical information.

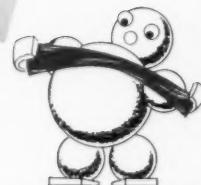
*You can put your confidence in*  
**GENERAL  ELECTRIC**

## **BOTH PLASTICIZERS HAVE OUTSTANDING**

**light stability  
heat resistance  
extrudability  
weather resistance  
pigment wetting ability**

**G-E 2557 HAS**  
**high plasticizing efficiency  
low viscosity  
light color  
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flexibility**

**G-E 2559 HAS**  
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**SEND FOR MORE DETAILS! —**

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